

THE ARMY RESERVE: OPTIMALLY SEEKING RELEVANCE AND READINESS IN A FISCALLY CONSTRAINED ENVIRONMENT

A Monograph

by

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ABSTRACT

THE ARMY RESERVE: OPTIMALLY SEEKING RELEVANCE AND READINESS IN A FISCALLY CONSTRAINED ENVIRONMENT, by Major John Gary Casey, U.S. Army Reserve, 69 pages.

On 29 October 2008, Secretary of Defense Robert Gates issued Department of Defense Directive 1200.17, establishing the overarching set of principles and policies to promote and support management of the Reserve Components as an operational force. Issued in a time of war and generous budgets, the Army Reserve spent freely to maintain its higher standards of deployability and operational tempo. As the United States enters another post-war period characterized by reductions in forces and spending, the Army Reserve must develop an approach to fiscal constraints pursuant to Secretary of Defense Chuck Hagel's budget reduction guidance, "to do more," while avoiding what Army Chief of Staff, Raymond Odierno has called the "perfect storm," of cascading economic effects across the Army. Throughout history, reserve forces regularly receive less funding during interwar periods and experience the reciprocating effects on manpower, training, and equipment. If unabated, uncertain financial constraints will eventually limit readiness and relevance. However, by designing a strategy to optimize the force while relying on Soldier ingenuity, the Army Reserve can balance readiness and continue to innovate as the United States and its military adapt to economic conditions.

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ACRONYMS

AC	Active Component
AR	Army Regulation
ARNG	Army National Guard
CCC	Civilian Conservation Corps
CS	Combat Support
CSS	Combat Service Support
DA	Department of the Army
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
IRR	Individual Ready Reserve
MRC	Medical Reserve Corps
OCO	Overseas Contingency Operations
ORC	Organized Reserve Corps
PAM	Pamphlet
RA	Regular Army
RC	Reserve Components – Consist of Reserve and National Guard
ROA	Reserve Officers Association
ROTC	Reserve Officer Training Corps
SECDEF	Secretary of Defense
TPU	Troop Program Unit
USAR	United States Army Reserve
USARC	United States Army Reserve Command
USC	United States Code

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INTRODUCTION

The challenge we've got is everybody has become very comfortable with the Army Reserve as part of the operating force. But we won't be able to fund it [or] to maintain it at that level all the time. I think managing those expectations within the force and outside the Army Reserve is going to be the real challenge.¹

—LTG Jeffrey Talley in Cunningham, “Lt. Gen. Jeffrey Talley takes Command of Army Reserve Command”

The Problem

The United States Army (U.S. Army) and United States Army Reserve (USAR or Army Reserve) are out of synchronization with the United States' economic capacity. After a decade of mobilizing over 200,000 Reservists, the Army Reserve is accustomed to spending freely and committing funds toward maintaining readiness and future appropriations. As governmental spending fluctuates, the Army needs to adapt its national defense spending for personnel, equipment, training, and execution of broad mission requirements. By narrowing mission focus and realizing the opportunities that come with fiscal constraint, the Army Reserve can apply optimization theory and its techniques throughout the organization and interconnected system of systems. As a result, the Army Reserve will avoid conditions that result in a “hollow force.”² Reserve transformation presents an opportunity to construct a culture of innovation down to the lowest level. The process of optimizing can impart conditions for a flexible force structured and capable of collaborative resourcing to meet financial changes.

¹Henry Cunningham, “Lt. Gen. Jeffrey Talley takes Command of Army Reserve Command,” *Fayetteville Observer*, 10 June 2012, <http://www.fayobserver.com/articles/2012/06/10/1183408> (accessed 17 March 2013).

²“Hollow force” is a term that observers use to describe the U.S. Armed Forces when military readiness declines and the services lack the resources to provide trained and ready forces, support ongoing operations, and modernize. James J. Carafano, Alane Kochems, David D. Gentilli, “The Hollow Force,” The Heritage Foundation, 27 January 2006, <http://www.heritage.org/research/reports/2006/01/the-hollow-force-background-and-issues> (accessed 31 March 2013).

When the U.S. fiscal condition requires constraint, the Army Reserve, as an operational force, must overcome the apprehension of losing appropriations. Bureaucratic mentalities must transform and support evolving requirements. Through an analysis of optimal control theory, applied to physical, social, and economic processes, leaders can identify and hone essential Soldier skills without a large budget. Since battles are interactive and war fighting is only a portion of the overall environment, Reserve leaders must understand the past and present while visualizing and describing a future capable of executing limited missions in peace and war. These same leaders must adapt themselves and organizational cultures by understanding the Reserve Components (RC), military operations, and interconnected systems. Through preparation and accompanying analysis, leaders can prepare their Soldiers for an uncertain future, while understanding the Army Reserve responses to previous financial hardship. When leaders realize where the organization came from, how it got here, and where it needs to go for an optimal future, they can overcome past mistakes and pursue a future that is “best for the country.”³

Methodology

This study contains three primary sections to focus on understanding the Army Reserve through history, optimization theory, and transformation. The aspiration is to present thoughtful discourse to propose novel and adaptive approaches for transforming organizational structures and processes. The Understanding the Army Reserve section historically advances from the Medical Reserve Corps (MRC) to the current operational force, identifying financial problems and their cascading effects upon military readiness during war and peace. The section regarding Optimization Theory introduces a construct and techniques applicable to advancing efficiencies beyond current precepts and into the realm of optimal control. Army Reserve Transformation is

³Claudette Roulo, “Dempsey: Transition in Military Uncomfortable, But Necessary” 17 August 2012, Joint Chiefs of Staff, <http://www.jcs.mil/newsarticle.aspx?id=979> (accessed 28 August 2012),

the last major section and discusses guidance from military leaders in an effort to identify themes for future change.

Military history is rich with tradition, doctrine and examples of growth, reduction and national service. By analyzing the MRC and its direct lineage to the Army Reserve, this study presents a narrative of changing forces, established to support a system for rebalancing forces in response to political and financial changes. Although reserve forces have existed throughout history, the last 105 years are the most relevant to understanding the growth and contraction of the U.S. Army and its three components, the Regular Army (RA), the Army National Guard (ARNG or National Guard), and the Army Reserve.

Optimal changes can move organizations beyond the notion they are strictly mechanical systems, emphasizing the broader nature of physical, social and economic processes as a source of key insights into the manner in which organizations best achieve innovative change. The application of optimal systems design to organizational change provides creative concepts to improve the way the Army is currently seeking to adapt and improve efficiencies. Because this transformation lacks a clearly articulated system-wide theoretical framework, seeking to develop a Total Force in the absence of a specific operational design and supporting doctrine, the process falls to the whims of Army culture and parochial bias. Optimization is a sound theory that can provide a practical framework toward this transformation process.

Unlike previous closed system efficiencies, optimization encompasses both closed and open systems to execute a broader approach to change. By applying measures of merit derived from practiced concepts the theory easily adapts to Army systems and processes. Throughout analysis, the application will identify the Army Reserve relationships between the Components regarding Army wide issues, responsibilities, and capabilities.

The Army Reserve has successfully supported the U.S. Army during ten years of war, yet now faces inherent difficulties compound by an environment of limited budgets and an unclear

future. Analysis of transformation requires a process of reframing the organization within the historical knowledge and unique perspectives of military, political, and economic outlooks. As the Army implements structural changes through force management, the Army Reserve faces changes in policies, doctrine, personnel, equipment, and mission responsibilities. In the absence of a looming major conflict and the corresponding increase in resources that would result, the Army Reserve will not experience dramatic or sweeping changes in future force structure. Instead, the organization should seek optimal change, preferably through an intellectual spark to ignite a dramatic conceptual leap in military doctrine or organizational change. The lack of an imminent threat and the scarcity of resources attempts to achieve radical change especially problematic, in the absence of conceptual advances. Ideally, the Army Reserve will overcome these problems through small and sequentially applied changes applied to calculated aspects of the military systems.

History abounds with examples of the failure to innovate. The dangers are evident. Procurement programs and their processes are expensive and lengthy. Once a substantial force redesign moves forward, it will take many years and substantial financial contributions if the chosen path is fundamentally flawed. The strategic leadership-driven approach of Army transformation ensures the stakes are even higher. Properly executed system adjustments require little effort to elicit emergent innovation from within the Army. Acceptance by the Army's senior leaders is instrumental for guiding Army component responsibilities to the strategic, operational, and tactical levels of war. This top-down approach is the Army norm, and success relies upon hierarchical adaptation. However, the economic nature of future change the Army is currently trying to achieve, and the questionable justification for such an extreme financial constraint to the current force begs the question whether a top-down approach is necessary or wise.

UNDERSTANDING THE ARMY RESERVE

The U.S. Constitution, United States Code (USC), military regulations, and policies govern the Army Reserve. Article I, Section 8, Clause 12 of the Constitution states, “The Congress shall have the power to . . .raise and support Armies, but no appropriation of money to that use shall be for a longer term than two years . . .”⁴ The "raise and support Armies" clause was the Framers' solution to defending against foreign powers without maintaining a standing army. The Founders accepted the need for an army but limited the appropriations through Congress, the branch of government closest to the people. Without funding through the House Appropriations Committee, approved every two years, the standing Army would financially cease to exist. Within the constitutional authority of Article I, Title 10 of the USC establishes the nation’s armed forces, and subsequently the Army. Within the Army, there are three components: the RA, USAR, and ARNG. The latter two according to Title 10 are part of the Reserve Components (RC), which also include the Air National Guard, Naval Reserve, Air Force Reserve, and Marine Corps Reserve. Currently the total mobilization potential of all of the RC is over three million personnel (see Appendix A). Federal and State authorities separate Army Reserve and National Guard responsibilities. The Army Reserve is always managed under Title 10; whereas, the National Guard is managed under Title 32, or Title 10 federal service if called upon by the President of the U.S. The diagram in Appendix A represents the Title 10 and Title 32 authorities and funding for the National Guard and Army Reserve. All U.S. Army components include civilians as well as officers, noncommissioned officers, and enlisted Soldiers.

Army Reserve

Founded in 1908, the Army Reserve provides the U.S. military additional technical expertise and capabilities to all levels of war, strategic, operational, and tactical. In the next few

⁴U.S. Constitution, art. 1, sec. 8, cl. 12.

years, the Army Reserve will undergo a period of economic turbulence in response to congressionally mandated spending cuts across the Department of Defense (DoD). Rather than simply accepting shortfalls in equipment and manpower that resulted in a hollow force after the Vietnam War; the Army Reserve has an opportunity to optimize its readiness and maintain relevance within the Army.⁵ The Army Reserve can lead that change through fiscal constraint and innovation. To discover and apply the optimal factors of unit readiness, the Army Reserve must know three facets: where it has been, where it is now, and where it is going. The following presents a historical narrative to analyze and understand the Army Reserve, its history and its place within the U.S. Army in an effort to synthesize a path to the year 2020 and beyond.

The Medical Reserve Corps

On 23 April 1908, Senate Bill 1424 “authorized the Army to secure a reserve corps of medical officers who could be ordered to active duty by the Secretary of War during time of emergency.”⁶ As a federal, reserve force supporting the Army, the Medical Reserve Corps (MRC) was the official predecessor of the Army Reserve.⁷ In addition, the political and economic circumstances of 1908 were ripe to establish this third Army component. Former volunteer Rough Rider, Theodore Roosevelt was President and amicable to continue Secretary Elihu Root’s military reforms toward building a force of national volunteers. Although, there was a run on the banks in 1907 the country entered a period of economic growth when the Aldrich-Vreeland Act

⁵CSAF Strategic Studies Group, “What is a Hollow Force?” U.S. Air Force, 18 May 2011, <http://www.af.mil/shared/media/document/AFD-120213-053.pdf> (accessed 24 March 2013).

⁶Richard B. Crossland and James T. Currie, *Twice the Citizen* (Amsterdam, Holland: Fredonia Books, 1983), 17.

⁷Office of Army Reserve History, *Army Reserve A Concise History*, U.S. Army Reserve Command, 11 November 2012, [http://www.usar.army.mil/ourstory/History/Documents/Concise History Brochure_FA_Web.pdf](http://www.usar.army.mil/ourstory/History/Documents/Concise%20History%20Brochure_FA_Web.pdf) (accessed 13 November 2012).

created a commission to address monetary reform and establish sound monetary policy.⁸ By 30 June 1909, the MRC had commissioned 364 physicians.⁹ These newly commissioned officers alleviated shortages of trained medical professionals in the regular army; only 301 medical officers served in the regular army in 1908.

Table 1. Number of Physicians in the MRC

Year	Non-Active Duty	Active Duty	Regular Army
1908			301
1910	245	175	345
1912	990	115	414
1914	1,163	91	426
1916	1,757	146	443

Source: Secretary of War, *War Department Annual Reports, 1908* (Washington, D.C.: Government Printing Office, 1980), vol. 1, 131-132; Secretary of War, *War Department Annual Reports, 1909* (Washington, D.C.: Government Printing Office, 1909), vol. 1, 173; Secretary of War, *War Department Annual Reports, 1910* (Washington, D.C.: Government Printing Office, 1910), vol. 1, 456; Secretary of War, *War Department Annual Reports, 1911* (Washington, D.C.: Government Printing Office, 1911), vol. 1, 151-152; and Secretary of War, *War Department Annual Reports, 1912* (Washington, D.C.: Government Printing Office, 1912), vol. 1, 781.

Between 1908 and 1916, the MRC grew to over four times the regular Army strength. Many members served on active duty supporting the nation. Twenty-two MRC officers served on active duty orders 28 June to 10 July 1913, providing medical care to Civil War veterans at their encampment for the 1913 Gettysburg Reunion.¹⁰ After the encampment, Surgeon General George

⁸Michael A. Whitehouse, "Paul Warburg's Crusade to Establish a Central Bank in the United States." *The Region* (1 May 1989), The Federal Reserve Bank of Minneapolis. http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=3815 (accessed 30 March 2013).

⁹ Crossland and Currie, 18.

¹⁰Pennsylvania Commission, *Fiftieth Anniversary of the Battle of Gettysburg* (Harrisburg, PA: Pennsylvania State Printer, 1914), 54.

Torney recommended activating more MRC officers to support Army maneuver camps.¹¹ In turn, the National Defense Act of 1916 expanded the MRC and designated it the Officers' Reserve Corps including dentists and veterinarians.¹² Unencumbered by state and National Guard legalities, the Officers' Reserve Corps lasted for 12 years, expanding to over 9,000 officers.¹³

The Organized Reserve Corps

Established under the National Defense Act of 1920, the Organized Reserve Corps (ORC) absorbed its predecessor the Officers' Reserve Corps as the nation entered into the 1920-1921 recession.¹⁴ The ORC comprised three new distinct branches, the Officers' Reserve Corps, Enlisted Reserve Corps, and Reserve Officers' Training Corps (ROTC).¹⁵ Formed after World War I, the ORC grew out of a deep sense of national commitment and dread of another war in Europe.¹⁶ It was also more economical than increasing the RA. Therefore, between the interwar years of 1919-1941, national defense planning prepared for 33 divisions within the ORC, some manned only with small groups of officers and enlisted personnel necessary to establish and train the division. Others were merely units on paper. Without drill pay, few within the ORC trained or pursued the Army profession. Those who did train were most often on active duty orders with the Regular Army, Citizens' Military Training Camps (CMTC), or Civilian Conservation Corps

¹¹Elihu Root, *Report of the Secretary of War* (Washington, D.C.: War Department, 1899), 52.

¹²Crossland and Currie, 19.

¹³John T. Carlton, John F. Slinkman, and Alexander Jackson. *The ROA Story* (Washington, D.C.: Retired Officers Association, 1982), 29.

¹⁴J. R. Vernon, "The 1920-21 Deflation: The Role of Aggregate Supply," *Economic Inquiry* 29, no. 3 (July 1991): 572.

¹⁵Office of Army Reserve History, *Army Reserve A Concise History*.

¹⁶Carlton, 19.

(CCC). Others without pay conducted inactive duty training (IDT) attending lectures, studying field sanitation or participating in correspondence courses.¹⁷ Surprisingly, when unemployment was at its peak during the Great Depression year of 1932, only 26 percent of the ORC conducted annual training (AT).¹⁸ Although, American policy makers began actively managing the economy, through interest rates and using massive government spending to spur growth, the training disparity between the RA and ORC continued and became evident leading into World War II (WWII).¹⁹

Table 2. ORC Active Duty Training (14 Days or Less)

Fiscal Year	Number Trained	Number Eligible	Percent Trained
1932	21,527	83,808	26
1934	11,944	88,107	14
1936	22,175	95,619	23
1938	26,089	100,116	26
1940	31,741	104,228	30

Source: Secretary of War, *War Department Annual Reports 1931-1940*, in Richard B. Crossland and James T. Currie, *Twice the Citizen: A History of the United States Army Reserve, 1980-1913* (Amsterdam, Holland: Fredonia Books, 2002), 48.

After WWII, Congress, with lobbying and assistance from the Reserve Officers Association, wrote legislation to authorize Reserve drill pay and retirement.²⁰ The ORC in 1948 finally received drill pay that Congress had approved the National Guard over 30 years earlier, under the National Defense Act of 1916. With a reorganized DoD in 1949, and mobilization

¹⁷Crossland and Currie, 40.

¹⁸Charles Duhigg, “Depression You Say? Check Those Safety Nets,” *New York Times*, 23 March 2008, http://www.nytimes.com/2008/03/23/weekinreview/23duhigg.html?pagewanted=all&_r=0 (accessed 30 March 2013).

¹⁹Ibid.

²⁰Carlton, 19.

lessons from WWII, the ORC in 1950 saw the mobilization of more than 240,000 to support the United Nations forces in Korea.²¹

The Army Reserve

Enacted during the Korean War, the Armed Forces Reserve Act of 1952 renamed the ORC as the Army Reserve and organized the RC into three categories that still stand today: the Ready Reserve, Standby Reserve, and Retired Reserve. Additionally the 1952 Act established Reserve Forces Policy Board (RFPB) as "the principal policy advisor to the Secretary of Defense on matters relating to the Reserve components."²² With additional voices from RFPD and political influence attributed to close community ties, the Army Reserve increased, while budget cuts forced the Active Army to reduce manpower. The influence of Army Reserve and National Guard grew through the Reserve Officer Personnel Act of 1954 and Reserve Forces Act of 1955.²³ This influence was evident, when President Eisenhower attempted to reduce drilling Reservist numbers below their 1957 authorization. In response to the President, in 1959 Congress voted to maintain Army Reserve paid drill strength at 305,000 and prevent further reductions.²⁴ Although the Army Reserve did not experience cuts similar to the Active Army during the Eisenhower era, the Army Reserve failed to foresee and adapt to oncoming fiscal constraints.

In an effort to build a more effective RC, Secretary of Defense Robert McNamara - against Congressional desires - proposed merging the Army Reserve and National Guard.

²¹Department of Defense, "About the Department of Defense," Department of Defense, <http://www.defense.gov/about/> (accessed 17 March 2013).

²²Reserve Forces Policy Board, "Mission and History," The Office of the Assistant Secretary of Defense Reserve Affairs, <http://ra.defense.gov/rfpb/mission/> (accessed 19 March 2013).

²³Crossland and Currie, 132.

²⁴Center of Military History, *American Military History Volume II*, ed. Richard W. Stewart (Washington, D.C.: Center of Military History, 2010), 263.

Secretary McNamara's statistical approach to analyzing the military looked more at efficiencies, and readiness, rather than the political nature of the RC. Unable to overcome congressional objections and political influences, Secretary McNamara backed off his merger proposal. Within his authority, Secretary McNamara began reducing Army Reserve and National Guard influence in the DoD. The DoD created the Office of Reserve Components to "supervise plans, policies, and programs" concerning Reserve forces, and the Chief of the Army Reserve lost control of the ROTC program when it transferred to the Deputy Chief of Staff for Personnel. The Office of the Chief Army Reserve (OCAR), established in 1967, simply provided the Army Reserve a voice within the Department of the Army (DA) rather than an Army Reserve command. Although the Army Reserve's political clout remained, the organization lost in relation to defense funding. The preponderance of Army funding for maintenance and equipment went to the RA, the Vietnam War, and to equip drafted Soldiers.²⁵

Largely for domestic, political reasons, President Lyndon Johnson relied on conscription, rather than a Reserve call-up, to support the Vietnam War. By publically announcing his decision, President Johnson indirectly established the RC a safe-haven from the draft. This sanctuary status did little to bolster the RC's position and contributed to the cultural divide between the AC and RC.²⁶ With growing opposition to the draft the President relented, and in May 1968, he called upon 42 battalion-size and smaller Army Reserve units. The DA selected the "most operationally ready units" from 34 states.²⁷ However, every one failed to meet the readiness standards primarily due to maintenance and equipment ratings of "not combat ready."²⁸ Of the 35 Army Reserve

²⁵Center of Military History, 273-276.

²⁶Charles J. Gross, "The Air National Guard: Past, Present and Future Prospects," *Airpower Journal* 10, no. 4 (Winter 1996): 64 and Crossland and Currie, 201.

²⁷Crossland and Currie, 202.

²⁸*Ibid.*, 204.

units sent to Vietnam, the Active Component (AC) filled many commissioned and non-commissioned officer (NCO) positions.²⁹ The WWII mobilization and deployment problems, repeated in Vietnam, reinforced a lack of confidence in the RC.

Shortly after taking office in 1969, Secretary of Defense Melvin Laird requested an independent commission, to study the feasibility of abolishing conscription and transitioning to an all-volunteer force. The resulting Gates Commission report led to Secretary Laird's 1970, Total Force Policy.³⁰ The Total Force Policy intended to establish an AC and RC bond and restore confidence by creating an integrated force structure. Initially pitched as One Army in the 1960s, the concept attempted to diminish the distinctions between the Active and Reserve Components.³¹ The Secretary of Defense and Army Chief of Staff intended this policy to eliminate duplication and reduce cost while transitioning some military capabilities to the RC. Ideally, the Army would operate homogeneously and without the parochialism found within the military services.

Charged with implementing Secretary Laird's policy, Chief of Staff of the Army, General Creighton Abrams increased reliance on RC units for rapid deployment in support of active forces. Because of General Abrams' oversight, many military personnel knew Total Force as the Abrams Doctrine. Proponents of the Abrams Doctrine believed linking the AC and RC would "make them inextricable," and ensure "that presidents would never be able to again send the

²⁹Crossland and Currie, 204.

³⁰Melvin K. Laird, "We Don't Need a Military Draft," *The Washington Post*, 21 February 2013.

³¹John F. Kennedy, "Radio and Television Report to the American People on the Berlin Crisis, July 25 1961," *Public Papers of the Presidents of the United States: John F Kennedy: Containing the Public Messages, Speeches, and Statements of the President, January 20 to December 31, 1961* (Washington, D.C.: U.S. Government Printing Office, 1962), 535.

Army to war without the Reserves and the commitment of the American people.”³² However, during the financially constrained decade after the end of the Vietnam War, there is little evidence that Total Force initially united the components or inhibited presidential decisions to employ a military force.³³

Total Force rebalancing between the AC and RC placed about half the Army’s combat forces in the AC, and two-thirds of the Combat Support and Combat Service Support in the RC.³⁴ According to policy analyst James Carafano, Total Force’s, “First-to-Fight Funding held that Active Component combat units deploying first need to be fully armed, trained, and manned.”³⁵ As a result, the RC suffered underfunding for equipment, and training. The budget’s disproportion “resulted in steeply tiered readiness with many reserve units unprepared for deployment without significant post-mobilization training and equipping.”³⁶ Without understanding the budget affects upon readiness, RC leadership accepted the Total Force policy simply because it justified missions, size, and composition of RC forces.³⁷ At the 1972 convention, ROA president, Brigadier General Gerald Heart stated, “We hear the term *Total Force* concept and . . . that the Reserves will have an important role to play in our nation’s

³²James T. Carafano, “Total Force Policy and the Abrams Doctrine: Unfulfilled Promise, Uncertain Future,” Foreign Policy Research Institute, 3 February 2005, <http://www.fpri.org/enotes/0050203.military.carofano.totalforcepolicyabramsdoctrine.html> (accessed 8 February 2013).

³³Ibid.

³⁴Department of the Army, *Department of the Army Historical Summary: FY 1990-1991*, U.S. Army Center of Military History, 1997. <http://www.history.army.mil/books/dahsum/1990-91/ch08.htm> (accessed 20 January 2013), ch.8.

³⁵Carafano.

³⁶Ibid.

³⁷Ibid.

defense. But, if . . . there will be corresponding reductions in the Reserve Forces, then we totally reject that concept.”³⁸ No RC general officer would lose his position, assuring approval.³⁹

After the fall of Saigon in 1975, Congress, as in the aftermath of every conflict, reduced the size of the Armed Forces. Cold War era nuclear deterrence continued to demand funding and kept military operations small. Despite expectations to transition AC capabilities to the RC within the Total Force, Army Reserve personnel numbers fell. From 1975 to 1979, drilling Troop Program Unit Soldiers dropped from 225,059 to 189,900, in response to economic conditions.⁴⁰ Not surprisingly, as conditions improved so did military spending. During the 1980s, Congress authorized an increase in Army Reserve strength to 312,825. However, growth in personnel did not necessarily equate to improved readiness. In 1989, only 65 percent of Army Reserve units rated an acceptable status of C-3 or better by measuring manpower, training, and logistics. Exercises such as Optimal Focus (March 1989 and January to February 1990), continued to highlight the dismal numbers and left Army leadership to doubt the Army Reserve’s competency.⁴¹ As a quote attributed to Mark Twain reflects, “History doesn’t repeat itself, but it does rhyme.”⁴² For almost two decades under Total Force, the Army Reserve remained in a state of tension between personnel and materiel readiness in comparison with the AC.

³⁸Carlton, 568.

³⁹Ibid.

⁴⁰Department of the Army, *Department of the Army Historical Summary: Fiscal Year 1975*, U.S. Army Center of Military History, 1997. <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013).

⁴¹Department of the Army, *Department of the Army Historical Summary: Fiscal Year 1989*, U.S. Army Center of Military History, <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013).

⁴²Eugene Volokh, "History Doesn't Repeat Itself, But It Rhymes." The Volokh Conspiracy, 15 February 2005. http://www.volokh.com/archives/archive_2005_02_13-2005_02_19.shtml (accessed 31 March 2013).

U.S. Army Reserve Command

With the fall of the Berlin Wall in 1989, the Army identified various initiatives to improve Army Reserve readiness. The most notable improvement, linked with improving integration, was the creation of the U.S. Army Reserve Command (USARC). A dedicated command provided a central structure to oversee manning, training and equipping units. On 1 October 1990, the Chief of Staff of the Army (CSA) established USARC at Fort McPherson, Georgia.⁴³ With the creation of USARC, The Chief of the Army Reserve (CAR) became the USARC commander and the U.S. Army Forces Command Deputy Commanding General for Reserve Affairs. With three hats to wear, an Army Reserve General Officer became the focal point for command and control (C2), of all Army Reserve Units.⁴⁴ The only exceptions were Army Reserve units reporting to U.S. Army Special Operations Command (USASOC).⁴⁵ USARC focused directly on readiness in personnel, equipment, and training as units began mobilizing in support of Operations Desert Shield and Desert Storm.

First Gulf War

War marked a turning point in how the Army Reserve integrated and responded to national defense requirements. Beginning in August of 1990, 80,000 Army Reserve Soldiers mobilized; of these 38,733 provided combat support and combat service support to the coalition

⁴³Office of Army Reserve History, *History - Home (US Army Reserve)*, U.S. Army Reserve Command, 1 November 2012, http://www.usar.army.mil/ourstory/History/Documents/Army_Twice%20the%20Citizen_Web.pdf. (accessed 9 February 2013).

⁴⁴Department of the Army, *Department of the Army Historical Summary: FY 1993*, U.S. Army Center of Military History, 1993, [http://www.history.army.mil/html.bookshelves/collect/dahsum.html](http://www.history.army.mil/html/bookshelves/collect/dahsum.html) (accessed 23 February 2013), ch. 6.

⁴⁵Department of the Army, *Department of the Army Historical Summary: FY 1990-1991*, ch. 9.

of forces in South West Asia.⁴⁶ A rapid mobilization and strong operational performance by Army Reserve units in the Persian Gulf increased expectations among AC counterparts. In the future, Army Reserve units needed to mobilize quickly and forward deploy in support of various contingencies.⁴⁷

Remaining Relevant

After the Liberation of Kuwait, the U.S. Army began reducing forces in relation to national economic conditions. In 1992, the Army consisted of approximately 710,233 AC, 275,789 Army Reserve and 431,200 National Guard Soldiers.⁴⁸ To remain relevant, the Army Reserve shifted some of its wartime focus to humanitarian and United Nations operations. Army Reserve units and individuals mobilized for Operation Restore Hope (Somalia 1992-1995); Operation Fuertes Caminos (Central & South America 1994), Operation Uphold Democracy (Haiti 1994-1995), Operation Provide Promise (Bosnia 1992-1996), and continually rotated Soldiers in support of Joint Military-to-Military Contact.⁴⁹ Additionally in 1994, Army Regulation (AR) 1-1, *Planning, Program, and Budgeting Execution System*, established guidelines for the CAR's responsibility to prepare and justify budget appropriations for the Army Reserve through the Army's Planning, Programming, Budgeting, and Execution System. With the CAR's greater control of the budget, Army Reserve units improved their equipment availability

⁴⁶Department of the Army, *Department of the Army Historical Summary: FY 1990-1991*, ch. 3.

⁴⁷Department of the Army, *Department of the Army Historical Summary: FY 1992*, U.S. Army Center of Military History, 2001, <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013), ch. 4 and ch. 7.

⁴⁸Department of the Army, *Department of the Army Historical Summary: FY 1990-1991*, ch. 9.

⁴⁹Department of the Army, *Department of the Army Historical Summary: FY 1994*, U.S. Army Center of Military History, 2000, <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013), ch. 5.

status. In 1992, Army Reserve units had obtained 69 percent of their required equipment-on-hand, and by 1999, most established units reached 90 percent and classified as C-1 upon mobilization. With control of the budget and a peacetime operational tempo, most reserve forces also met their training requirements.

Table 3. U.S. Army C Level Ratings

C Level Rating	Definition
C-1	Can perform full wartime mission
C-2	Can perform most of wartime mission
C-3	Can perform some of wartime mission

Source: Department of the Army, *Department of the Army Historical Summary: FY 1994*, U.S. Army Center of Military History, 2000, <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013).

By 1999, the Army consisted of approximately 479,426 AC, 206,836 Army Reserve, and 357,469 National Guard Soldiers.⁵⁰ In response to budget reductions, the Army cut the Total Force by over 373,000. Over a period of seven years (1992-1999), the Army became what some have called a hollow force. Because of dwindling numbers and financial constraints, the AC and RC searched for army-wide efficiencies. Hard times force innovative measures, and the best example of combining collaboration and efficiencies was the establishment of the Total Army School System (TASS).

TASS

A 1999 study by the RAND Arroyo Center, titled *Consolidating Active and Reserve Component Training Infrastructure*, analyzed the initial successes associated with integrating active and reserve schools. This integration demonstrated the possibility for “further integration

⁵⁰Department of the Army, *Department of the Army Historical Summary: FY 1999*, U.S. Army Center of Military History, 2006, <http://www.history.army.mil/html.bookshelves/collect/dahsum.html> (accessed 23 February 2013), ch. 5.

of training resources into a common Army training system that is truly seamless and component blind.”⁵¹ Of primary interest, the RAND Arroyo Center study provided detailed technical descriptions and optimization modeling to minimize cost. The model used a linear function programmed with objectives and constraints to identify the optimal location, size, and time for Army schools and training. Pressure from the U.S. Army Training and Doctrine Command (TRADOC) to optimize individual training drove the analysis of resources. By combining AC and RC schools under a centralized system, TRADOC found efficiencies and eliminated redundancy where possible. Prior to the establishment of TASS, each component attempted to coordinate training responsibilities while maintaining separate instructors, facilities, and equipment. By developing an optimization model to determine the least-cost assignments of students to schools, the Arroyo Center at RAND Corporation demonstrated successful formulas for unifying Army training.⁵² For example, the following equations establish optimal class size by identify the minimum $\sum_i \sum_j X_{i,j,k,l} \geq M_k W_{k,l}$ and maximum $\sum_i \sum_j X_{i,j,k,l} \leq Q_{k,l}$ values for available courses and locations.⁵³ Although optimization theories have been around since WWII, few military leaders understood how application across multiple component-training systems could unify the force and enhance efficiencies.

Throughout the 1990s, systems engineers and organizational management specialists identified that any attempt to change or improve a system must be based on a solid definition of “what the system is supposed to accomplish.” The DoD initially applied a systems understanding and approach in 1988 to implement the principles of Total Quality Management (TQM). In response to the DoD initiative, the CSA published AR 5-1, *Total Army Quality Management* to

⁵¹John F. Schank et al., *Consolidating Active and Reserve Component Training Infrastructure* (Washington, D.C.: RAND , 1999), iii.

⁵²Ibid., xi.

⁵³Ibid., 41.

improve performance and efficiency while integrating a “strategic management approach for achieving performance excellence.”⁵⁴ Although several aspects of this regulation are presently outdated, the core principals of paragraph 3-1 are still applicable:

1. Leadership vision and commitment
2. Mission and customer focus
3. Employee empowerment
4. Continuous improvement⁵⁵

Performance excellence, according to AR 5-1, “results when all organizational strategic goals, objectives, and processes are linked and aligned to optimize the delivery and quality of the products or services required by its customers with a minimal expenditure of resources.”⁵⁶ The Army’s approach to achieve organizational performance excellence and continuous improvement still applies to the Army Reserve. Leaders attempting to implement their vision through new policies and procedures without an understanding of system complexity will fail without a complete picture of processes. Changes in most military systems are expensive, but small optimal changes within systems can achieve economically sound results. Therefore, to understand, visualize, describe and implement improvements, military and civilian leaders at all levels should have a solid foundation of what the Army Reserve is supposed to accomplish.

⁵⁴Department of the Army, Army Regulation 5-1, *Total Army Quality Management* (Washington, D.C.: Department of the Army, 15 March 2002), 2.

⁵⁵Ibid.

⁵⁶Ibid.

War on Terror

Shortly after the terrorist attacks of 11 September 2001 (9/11), President George W. Bush used the phrase “war on terror” to describe the U.S. resolve to defend against non-state actors.⁵⁷ The subsequent military response accelerated the RC operational tempo, expanding the rate and length of time units mobilized. Operational tempo provided less time for training and maintenance while lengthening deployments from 30-90 days to one year or more. Between Operation Desert Storm and 9/11, few Army Reserve Soldiers mobilized. After 9/11, most experienced one or two call-ups within their statutory eight-year contract. As Army Reserve Soldiers began deploying to Afghanistan and Iraq, Lieutenant General James R. Helmsley, CAR in 2005, brought to light issues within the Army Reserve. Although many units had the personnel, equipment, and training to mobilize, their capabilities did not correspond with initial requirements. Therefore, Reservists augmented the AC and backfilled RC units through a piecemeal process.⁵⁸ Many RC units lost their readiness rating of C-1, when personnel cross-leveled to bring other units to C-1 and a deployable status.⁵⁹ Additionally in 2005, the Army Chief of Staff, Peter Schoomaker published Army Field Manual (FM) 1, *The Army*, defining what the Army Reserve is rather than what it is not.

The Army's primary federal reserve force. It is a complementary force consisting of highly trained Soldiers and units able to perform a vast range of missions worldwide. Their primary role is to provide the specialized units, capabilities, and resources needed to deploy and sustain Army forces at home and overseas. The Army Reserve is also the Army's major source of trained individual Soldiers for augmenting headquarters staffs

⁵⁷George W. Bush, *Address Before a Joint Session of the Congress on the United States Response to the Terrorist Attacks of September 11*, 20 September 2001, The American Presidency Project, <http://www.presidency.ucsb.edu/ws/index.php?pid=64731&st=&st1=#> (accessed 30 March 2013).

⁵⁸Bradley Graham, “General Says Army Reserve Is Becoming a 'Broken' Force,” *The Washington Post*, 6 January 2005, A01.

⁵⁹Cross-leveling terminology in this document refers to personnel and materiel as used by the Army Reserve. The DoD definition only refers to materiel.

and filling vacancies in Regular Army units. The Army Reserve provides a wide range of specialized skills required for consequence management, foreign army training, and stability and reconstruction operations. Many of its Soldiers are civilian professionals.⁶⁰

The cascading effect of augmenting staffs and filling vacancies left few units intact as the Army forgot one of the many lessons learned during the 1950s. From the Korean War, General Matthew Ridgeway noted unit integrity or cohesion was imperative for mobilizing reserve combat units.⁶¹ Since 9/11 and despite unit cross leveling, over 200,000 Army Reserve Soldiers mobilized in support of military operations in the Middle-East, Africa and other locations around the world. The integration of AC, Army Reserve, and National Guard to meet mission requirements reinvigorated the Total Force concept across the Army.

Operational Reserve

Shortly after Lieutenant General Helmsley's warning, Lieutenant General Jack Stultz replaced him as the 31st CAR, and along with other RC leaders ushered in the terminology of an operational reserve.⁶² At a time when RC Soldiers saw multiple deployments, RC leaders petitioned to improve various Soldier support programs and assist Army Reserve families and employers with resources and understanding of Soldier deployments. Before 2008, the Total Force policy of 1973 and other changes failed to incorporate the RC into the operational force. An operational reserve remained a theory while the Army in practice, viewed the RC as a strategic reserve requiring little funding and few resources.

⁶⁰Department of the Army, Field Manual 1, *The Army* (Washington, D.C.: Department of the Army, 14 June 2005), 2-11.

⁶¹Carlton, 417.

⁶²John Orrell, "Reserve & Guard leaders to House Subcommittee: We should remain Operational Reserve." The Office of the Assistant Secretary of Defense Reserve Affairs, 30 March 2011. <http://ra.defense.gov/news/main/operationalReserve.html> (accessed 30 March 2013).

On 29 October 2008, Secretary of Defense, Robert Gates through Department of Defense Directive (DoDD) 1200.17, specified management of the RC as an operational force. DoDD 1200.17, with a subject line of “Managing the Reserve Components as an Operational Force,” established the “overarching principles and policies to promote and support the management of the Reserve Components (RC) as an operational force.”⁶³ Issued in a period of war and fiscal largess, this directive indicated higher expectations for RC personnel, equipment, and training, without addressing the appropriations or allocations to maintain the RC on par with the Army’s active component. Instead, subsection 4g of DoDD 1200.17 encouraged RC personnel voluntarily perform duty rather than proportioning resources to meet mission requirements. To its credit, DoDD 1200.17 stated in subsection 4h “the RCs are resourced to meet readiness requirements per [Title 10] sections 3013, 5013, and 8013,” and ensure RC resourcing plans “ensure visibility to track resources from formulation, appropriation, and allocation through execution.”⁶⁴ What DoDD 1200.17 failed to identify was that sections 3013, 5013, and 8013 specify requirements and responsibilities of the Service Secretaries (Army, Navy, and Air Force) and not RC resources. Additionally, the directive established the overarching set of principles and policies for managing the RC while establishing key responsibilities within the DoD.⁶⁵ As part of this change, the DoD increased funding to the Army Reserve by \$274,100,000 between fiscal year 2007 and 2008.⁶⁶

⁶³Robert Gates, U.S. Secretary of Defense, Department of Defense Directive 1200.17, *Managing the Reserve Components as an Operational Force* (Washington, D.C.: Department of Defense, 29 October 2008), 1.

⁶⁴*Ibid.*, 2.

⁶⁵John D. Winkler, “Developing and Operational Reserve” *Joint Forces Quarterly* 59, no. 1 (2010): 15.

⁶⁶Calculated from the actual Army Reserve Fiscal Year 2007 and 2008 Operation and Maintenance appropriations spending published in 2009 and 2010 Secretary of Defense O&M Overview.

With this level of funding, the Army Reserve could keep at least 25 percent of its Soldiers on active duty.

Table 4. USAR Total Strength and Operations and Maintenance Funding for FY07 and FY08

Year	Total USAR Soldiers	O&M Funding
2007	189882	\$2,450,600,000.00
2008	197024	\$2,724,700,000.00

Source: Office of the Undersecretary of Defense (Comptroller), DoD Budget Request, “Operations and Maintenance Overview,” Department of Defense, <http://comptroller.defense.gov/budget2008.html> (accessed 30 March 2013), 38 and Office of the Undersecretary of Defense (Comptroller), DoD Budget Request, “Operations and Maintenance Overview,” Department of Defense, <http://comptroller.defense.gov/budget2009.html> (accessed 30 March 2013), 38.

In 2008, prior to establishing the RCs as an operational force, military thinkers analyzed whether an operational reserve would replace the strategic reserve within current military structures. What the Reserve Officer’s Association Resolution (ROA) 09-04 declared was “the Commission on the National Guard and Reserves has recommended that Reserve Components be divided into operational and strategic divisions.”⁶⁷ Renewed as ROA Resolution 11-06, the declaration further states,

[T]he Reserve Components serve in both operational and strategic roles to meet the nation’s defense requirements in peace and war; and the Reserve and Regular Components of each service are increasingly integrated as a Total Force; and each service provides and presents different competencies required by combatant commanders in order to meet the defense requirements of the United States; and the services each have its own force generation models and the services organize, train and equip their Reserve

⁶⁷Reserve Officers Association. Resolution 11-06. *Management of Operational and Strategic Forces of the Reserve Components*, 2 February 2011, http://www.roa.org/site/PageServer?pagename=1106_Resolution_MgmtofOper_StrategicRC&AddInterest=1621 (accessed 30 March 2013).

Components to a prescribed level of readiness prior to mobilization to limit post-mobilization training and to maximize operational deployment time.⁶⁸

The ROA statement refutes the RC single designation as an operational force per DoDD 1200.17 and instead notes the RC has roles as strategic and operational forces. In the previous century, the ROA identified the RC as a strategic force. The primary difference between the strategic reserve of the 20th century and the operational reserve of the 21st century is the tempo and readiness level that forces maintained for mobilization and support to overseas contingency operations. Traditionally, a strategic reserve mobilized only in times of war, while the operational force maintains readiness for continuously mobilizing forces.

Army Force Generation Model (ARFORGEN)

On 4 February 2011, the Secretary of the Army, within his requirements and responsibilities, approved the Army Campaign Plan (ACP). The ACP provides a blueprint for balancing the all-volunteer force using the ARFORGEN to “provide a sustained flow of trained and ready forces for full-spectrum operations and to hedge against unexpected contingencies . . . over the course of the next six to eight years.”⁶⁹ Containing a key theme of “effectively and efficiently using resources to transform the Army in a fiscally constrained environment” the ACP proposes high expectations of full-spectrum operations, without hedging against expected budget cuts.⁷⁰ In response to and purportedly synchronized with the ACP, the *Army Reserve 2020 Vision and Strategy* (May 2012), establishes the foundation for operational concepts and strategies required for an enduring operational force. The Army Reserve vision came shortly after the ACP

⁶⁸Reserve Officers Association. *Management of Operational and Strategic Forces of the Reserve Components*.

⁶⁹The Official Home Page of the U.S. Army, "Army Campaign Plan 2011," *Stand-To!* 8 February 2011, <http://www.army.mil/standto/archive/2011/02/08/> (accessed 25 March 2013).

⁷⁰*Ibid.*

and does not express the same fiscal constraint theme. The Army Reserve's vision instead follows DoDD 1200.17's guidance in managing the operational force without addressing budgetary means.

Whether or not forces are on or off active duty, should correspond with ARFORGEN. AR 525-29, *Army Force Generation*, describes the model and provides a familiar structure to reduce the stress of understanding new constructs during Army transitions. ARFORGEN is the Army's core process and a key component of transformation, and models the reset, train/ready, and available force pool leading up to mission execution. These three are part of a cycle to prepare units for a deployable mission. With the right mix of AC and RC in the available pool, the Army can field capabilities to meet operational requirements. Below is a brief explanation of the cycle, focusing upon Army Reserve features.

Reset is the first set or status of units in ARFORGEN. In reset, units receive personnel and conduct less resource intensive administrative training and functions. This period affords unit leaders the opportunity to plan their ARFORGEN cycle, understand the units' history, and know where each fits within the Army and national strategies. Reset is the time for Army Reserve Soldiers to attend professional development and individual training at TRADOC schools. Planning and individual skills are the foundation for collective training.

The train-ready years reorient units toward their collective or organizational mission sets. Crucial to readiness is the ability to optimize the unit based upon available funding for personnel, equipment and training. To achieve readiness in the train-ready years requires a change from the traditional 48 battle training assemblies (one weekend per month) and 14 days of annual training to the incorporation of additional assemblies and up to 29 days annual training in the last train-ready year.

During the available year, units fully or partially mobilize for 365 days to conduct appropriate missions supporting non-contingency operations. Army Reserve leaders from the top

down must ensure adequate funding is available and adherence to ARFORGEN. To mobilize and deploy Soldiers and units requires complete funding during a war or a national emergency declared by the President or Congress, and optimally reduced funds for non-contingency or limited operations. These non-contingency operations could include homeland support, and security cooperation.

Within the force generation cycle, the Army must continuously build, train, and employ Soldiers and units. In effect, the structure of the Army Reserve's operational force would continuously adapt as units move through the ARFORGEN cycle using optimization techniques. With the inclusion of the RC in the Army's operational force, a reduction in the Active Army structure, and alternating state and federal requirements for the National Guard, the Army Reserve could anchor, and if fully integrated, manage operational aspects within the strategic, operational, and tactical Total Force.

Redefining Contingency

Recently the Army published Army Doctrine Publication (ADP) 1, *The Army*. Along with 14 other ADP publications, the Army compressed its fundamental operating principles. ADP 1, which replaced FM 1, identified what the Army Reserve 'is not' rather than what it is. ADP 1 stated, "the Army Reserve is not organized and manned for contingency response."⁷¹ This definition from ADP 1 imposed Army limits on the Army Reserve's future. Pursuant to Title 10 §101(a) (13) a "contingency operation" means a military operation that,

(A) is designated by the Secretary of Defense as an operation in which members of the armed forces are or may become involved in military actions, operations, or hostilities against an enemy of the United States or against an opposing military force; or

(B) results in the call or order to, or retention on, active duty of members of the uniformed services under section 688, 12301 (a), 12302, 12304, 12304a, 12305, or 12406

⁷¹Department of the Army, Army Doctrine Publication 1, *The Army* (Washington, D.C.: Department of the Army, 7 November 2012), A-2.

of this title, chapter 15 of this title, or any other provision of law during a war or during a national emergency declared by the President or Congress.⁷²

This change from contingency to non-contingency response manning, in Army doctrine, indicates a fundamental shift in understanding for the purpose and scope of future Army Reserve organizations. Rather than forming for military actions, operations or hostilities, against an enemy the Army Reserve will staff units for non-contingency operations. Although this changes organization and manning, ADP 1's definition opens opportunities to ideologically reframe the Army Reserve. However, prudence requires the Army Reserve maintain the capability for adapting to contingency operations when declared by the President, Secretary of Defense, or Congress.

Ending the War

The U.S. Armed Forces are currently in the process of withdrawing from Afghanistan and transitioning from a Middle East focus on Air-Land Battle to a Pacific focus on Air-Sea Battle. The Army is looking for new efficiencies and a means to maintain capabilities while spending fewer taxpayer dollars. Over the next five years, the AC is decreasing end strength by approximately 70,000 Soldiers to about 490,000.⁷³ Similar to the post WWII drawdown, Congress is maintaining the size of the Army Reserve while reducing the AC.

⁷²Title 10 U.S. Code, "Armed Forces," Section 101(a) (13) a., 2012.

⁷³Elizabeth M. Collins, "Secretary of the Army talks about the Army of today, the Army of 2020." *Soldiers* (22 June 2012), <http://soldiers.dodlive.mil/2012/06/secretary-of-the-army-talks-about-the-army-of-today-the-army-of-2020/> (accessed 30 March 2013).

Table 5. Army Authorized End Strength for FY01 and FY13

Authorized End Strengths	Fiscal Year 2001	Fiscal Year 2013
Active Army	480,000	552,100
Army National Guard	350,000	358,200
Army Reserve	205,000	205,000

Source: Assistant Secretary of the Army for Financial Management and Comptroller, “Budget Materials for FY 2001: Army Reserve (OMAR),” Army Financial Management, Department of the Army, <http://www.asafm.army.mil/offices/BU/BudgetMat.aspx> (accessed 30 March 2013), 1 and Assistant Secretary of the Army for Financial Management and Comptroller, “Budget Materials for FY 2013: Army Reserve (OMAR),” Army Financial Management, Department of the Army, <http://www.asafm.army.mil/offices/BU/BudgetMat.aspx> (accessed 30 March 2013), 1.

Even as, the Army Reserve reduces the number of personnel on active duty for Overseas Contingency Operations, its funding for Operations and Maintenance (O&M) is increasing. A review of the Fiscal Year 2013 O&M Overview indicates the AC will reduce spending by \$54 billion between 2011 and 2013. This comes at the same time the National Defense Authorization Act for Fiscal Year 2013 maintains the Selected Reserve at the 2001 authorization levels (205,000). Although there are no budget reductions in either the Secretary of Defense O&M overview or the President’s budget, the global economic situation signifies the U.S. is at the cusp of a transition point. In preparation for deeper cuts, the RC should optimize for greater financial constraints similar to the 1990s.

OPTIMIZATION THEORY

Most comprehensive solutions to complex problems have a solid foundation in theory and proof in reality. For example, Sir Isaac Newton’s *Philosophiæ Naturalis Principia Mathematica* (“the Principia”), published in 1687, represents the gravitational attraction between two masses as its inverse proportionality to the square of the distance between them or $F = G \frac{m_1 m_2}{r^2}$. For the purposes of this paper, it is not necessary to mathematically understand Newton’s

theory, but rather know that Albert Einstein superseded Newton with his general theory of relativity. Einstein's theory accounted for additional variables outside Newton's observations and thus his model. Optimization theory offers a novel and more comprehensive approach to identify and incorporate additional variables, similar to Einstein.

One definition of optimization currently comes from Klaus Krippendorff at the University of Pennsylvania Annenberg School of Communications. His definition is,

A mathematical technique for determining the most profitable or least disadvantageous choice out of a set of alternatives. Typically, the set of alternatives is restricted by several constraints on the values of a number of variables and an objective function locates the optimum in the remaining set. The method is largely used in operations research and systems analysis, e.g., for optimal scheduling of production processes, for determining the best way for transporting a certain commodity.⁷⁴

Expounding upon the mathematical basis, optimization offers a theoretical foundation for a whole of government approach to managing and utilizing the Army, and within the Army an enterprise approach to strategic, operational, and tactical formations in the Army Reserve. Additionally, there are potentially promising results if the Army Reserve optimizes its resources in conjunction with other governmental agencies to devise the appropriate interactions through an optimal systems analysis.

Queen Dido

The objective of optimization theory is to determine and apply the variables that will cause a process to satisfy the fiscal constraints and at the same time minimize (or maximize) performance criterion. According to Optimal Control Theorist Donald Kirk, the first example of optimization comes from the story of Dido, some 2,600 years before Sir Isaac Newton's

⁷⁴Klaus Krippendorff, "Optimization Theory," Klaus Krippendorff's Dictionary of Cybernetics, <http://cleamc11.vub.ac.be/ASC/Kripp.html> (accessed 9 August 2012).

Principia.⁷⁵ In the *Aeneid*, Roman Poet Virgil writes of Dido and her foundation of Carthage along the North African coast. Dido a Phoenician Queen and her husband were extremely wealthy traders in Tyre. Her brother, the ruling King Pygmalion became jealous of their wealth and murdered Dido's husband to make this wealth his own. The Queen and her followers fled to North Africa where she petitioned King Iarbus for an amount of land that an ox-hide could enclose. Iarbus granted Dido's request. She carefully cut the ox-hide into thin strips and placed them around a hill allowing each end to touch the Mediterranean Sea. This indirect and ingenious solution of enclosing the maximum area is what theorists commonly referred to as the Dido or isoperimetric problem.

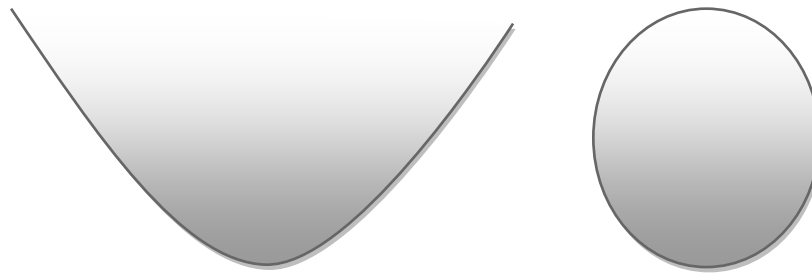


Figure 1. Isoperimetric Problem

Source: Created by Author

Explaining Optimization

Most literature on optimization theory or optimal control theory describes the application toward economics and computer programming. However, optimal controls are applicable to maximizing returns and minimizing costs of operating physical, social, and economic processes. In his book, *Optimal Control Theory*, Donald Kirk builds from elementary linear application into the calculus of non-linear solutions. One example he uses is the problem of identifying calculable

⁷⁵Donald E. Kirk, *Optimal Control Theory* (Englewood Cliffs, NJ: Prentice-Hall, 1970), 107.

performance measures used to design an automated aircraft landing system.⁷⁶ The design has various assumptions based upon known principles of aeronautics. Within these assumptions, Kirk identifies the possibility of solving the minimum principal and the impossibility of solving unbounded equations. Recognizing the initial analysis provides knowledge of form that is essential in the optimization of processes. When applied to processes, optimization theory can yield a relationship between a process and an optimal control if one exists. Optimization theory applies primarily in mathematics and economics but has utility in Army logistics and management science.

Isoperimetric problems, originally associated with Euclidean geometry, have expanded into other fields such as economics, cybernetics, and systems analysis. Many have adopted the term optimization or optimal control to describe techniques and calculations used to reach an optimal solution despite the cascading and often exponential variables that affect each step of the process. Similarly, the Army Reserve must look to ingenious solutions and identify cascading affects in a fiscally constrained environment. Thereby, avoiding the “perfect storm” General Raymond Odierno referred to on 24 January 2013.⁷⁷ Maximizing or minimizing output to determine the most profitable or least disadvantageous choice is not easy to solve. Mathematically the problem requires increasingly smaller increments calculated using more variables as in the previous problem or more fully in Optimization theory. Finding a non-linear solution to a linear problem often introduces a number of error criteria.

In 1947, George Bernard Dantzig published a simplex algorithm for linear programming. The term programming here does not refer to computers; rather, the term comes from the use of

⁷⁶Kirk, 42.

⁷⁷Raymond T. Odierno, quoted in J. D. Leipold, “CSA Warns of Budgetary Perfect Storm,” Army News Service, 25 January 2013, http://www.army.mil/article/95015/CSA_warns_of_budgetary_perfect?storm?/ (accessed 30 March 2013).

the program by the U.S. military to refer to proposed training and logistics schedules. Dantzing's work for the U.S. Air Force Comptroller's Office helped optimize transportation and staging of military supplies. Dantzig also worked for the RAND Corporation from 1952 until 1960 where he wrote a series of research memoranda expanding his theory to other applications. The RAND Arroyo Center publication, *Consolidating Active and Reserve Component Training Infrastructure*, did not cite Dantzing, but his formulas are likely the basis for many of the study's postulates in relation to optimizing the TASS.

Optimal control problems are often non-linear and do not have analytic solutions (e.g., like the linear-quadratic optimal control problem). As a result, it is necessary to employ numerical methods to solve optimal control problems. In the early years of optimal control (circa 1950s to 1980s), the favored approach for solving optimal control problems was that of indirect methods. In an indirect method, the calculus employs variations to obtain the first-order optimality conditions. These conditions result in a two-point (or in the case of a complex problem, a multi-point) boundary-value problem. This boundary-value problem has a distinctive structure because it arises from taking the derivative of a Hamiltonian of optimal control theory developed by L. S. Pontryagin as part of his minimum principle.⁷⁸

Army Reserve Application

The Army Reserve can apply Optimization throughout the organization in a variety of ways. Because the Army Reserve is primarily in the business of Combat Service and Combat Service Support, optimization problems can determine the optimal size for units, their required equipment, and potential employment methods. For example, a transportation unit supporting a heavy combat brigade needs to deliver water, food, fuel, ammunition, repair parts, and other

⁷⁸Stanford University, "Memorial Resolution: George Bernard Dantzig," *Stanford Report*, 7 June 2006. <http://news.stanford.edu/news/2006/june7/memldant-060706> (accessed 28 March 2013).

logistics support. Optimization not only calculates the best route between supply depots and the heavy brigade but also brings in all available external variables. Weather, road conditions, vehicle levels of maintenance, crew rest, imagery detecting possible improvised explosive devices, traffic density at various times of day or night, and a litany of other internal and external data sources. By factoring in all the additional variables, the unit can calculate the optimal time and route to deliver relevant supplies. In relation to military planning, the art is identifying the relevant variables and weighting their importance. The science is developing an algorithm and computer simulation that determines the optimal solution. By using appropriate algorithms and computer simulations, the Army Reserve can determine the optimal time, distance, cost, or other parameters from multiple perspectives. For example, sets of variables can support viewpoints of Prevent, Shape, and Win within the Army or adjust to budget terminology when addressing financial constraints. Ideally, a common terminology will emerge as optimization develops within the Army Reserve or a broader government approach.

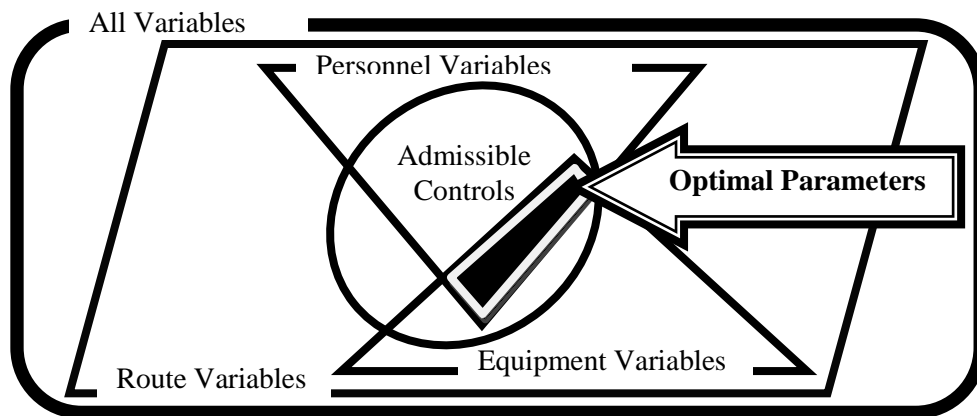


Figure 2. Optimal Parameters

Source: Created by Author

If the Army Reserve expands optimization principals beyond the military enterprise and includes a whole of government approach with diplomatic, informational, and economic variables, the complexity of this model grows and requires sophisticated algorithms. However, by reducing each set of calculations to one of the components and a level of war, the Army and Army Reserve can reduce potential variables into manageable data sets. The Army Reserve's goal should be to establish sets rather than reduce every structure and process to an algorithm. Other theories such as complexity and chaos attempt to reduce all actions to micro events or calculations, and although there is utility in seeking minute details, the process reaches a point of futility or irrelevance to the macroscopic structure or process.

A recent example of optimal sophistication comes from the National Aeronautics and Space Administration (NASA). In 2010, the Charles Stark Draper Laboratory in Houston, with a team from the Naval Postgraduate School, optimized a NASA observation satellite to “scan the sky faster than even its mission controllers thought possible.”⁷⁹ The team used a comprehensive approach to calculate an optimal path rather than the shortest distance. The satellite's motion achieved minimal fuel consumption by factoring in micro gravitational forces from other objects, solar radiation, and external components to the satellite's motion. Internally the satellite's systems could not make the necessary calculations to maneuver with so many computations. To overcome the satellite's limitations the team used a computer program, appropriately named Dido, to make the necessary calculations for plotting trajectories. NASA then uploaded new maneuver instructions that were within the parameters of the satellite's onboard control systems. According to the team, “the real challenge is figuring out what those instructions should be, which requires solving mathematical puzzles, known as optimal control problems.”⁸⁰ The optimized satellite

⁷⁹Nazareth Bedrossian, Mark Karpenko, and Sagar Bhatt, “Overclock My Satellite,” *IEEE Spectrum* 49, no. 11 (November 2012): 54.

⁸⁰*Ibid.*, 62.

operated beyond its purported limits, extending its mission duration and usefulness without installing new hardware or driving up costs.

These examples demonstrate the possible simplicity and sophisticated progression of optimization theory in practical use. However, there are no magic bullets to optimizing a system or organization. Optimizing takes mental agility, time, and hard work to educate an organization regarding the concepts and to train personnel in applying optimization techniques. The most difficult task is acceptance. Optimization theory and practice will likely begin with misconceptions and rejection as internal battles for control and success tend to proliferate throughout bureaucratic governmental organizations. Once past these initial hurdles, an optimization program should align in a way that insures individual and organizational success.

Optimization versus Efficiency

Although there are similarities, optimization is not simply seeking efficiencies or doing more with less. Optimization is the advancement of efficiencies to understand variables and forces beyond current systems structures and processes. Both analyze systems and apply solutions to improve performance, but optimization holds an inherent advantage if applied to a whole of government approach. Steve Kenniston uses computer storage to explain the difference between efficiency and optimization.⁸¹ In his explanation, Kenniston points out “there are some semantics when talking about . . . efficiency and optimization technologies,”⁸² but a macro view clarifies the differences. Kenniston describes efficiency as the virtualization or compression of data within a storage system. These types of provisioning can improve storage, but do not increase physical capacity of the system. Similarly, the Army utilizes Lean Six Sigma and other programs to

⁸¹Steve Kenniston, "Efficiency vs. Optimization," The Storage Alchemist, 30 June 2011, <http://www.thestoragealchemist.com/efficiency-vs-optimization> (accessed 30 March 2013).

⁸²Ibid.

develop efficiencies.⁸³ Optimization expands these efficiencies by looking beyond the storage parameters. Optimal control analysis identifies that external systems are available for rapidly adapting the storage system's performance and availability. Optimization techniques then move high demand data dynamically to online systems. As a result, access improves because optimization software dynamically maintains the data outside the storage system. On the backend, more space is available internally for virtualization and compression. Kenniston's data model is not comprehensive for all systems, but provides an example for the Army Reserve to continue efficiencies inside the organization or closed system while seeking external or interagency sources for collaborative improvements.

ARMY RESERVE TRANSFORMATION

In 2004, Army transformation centered upon a strategy to rebalance the forces. Initiated by a 2003 Secretary of Defense memo, the components focused upon three areas.

1. Enhance early responsiveness
2. Resolve stressed career fields
3. Employ innovative management practices⁸⁴

Early response assumed that Active and Reserve forces would respond together, utilizing available Soldiers. For Reservists, this pool would recruit individual volunteers for temporary tours on active duty and reduce the stress of involuntary mobilizations experienced in high

⁸³Deputy Chief of Staff Army G1, "Lean Six Sigma, Green Belt," Army G1, 2 January 2012, <http://www.armyg1.army.mil/leansixsigma/greenbelt.asp> (accessed 30 March 2013).

⁸⁴The Office of the Assistant Secretary of Defense for Reserve Affairs, *Rebalancing Forces*, Reserve Affairs Publications, 15 January 2004, <http://ra.defense.gov/documents/publications/rebalancingforcesfinalfinald1.pdf> (accessed 30 March 2013).

demand career fields. By employing innovative force management practices, the DoD assumed the Army could achieve flexibility in applying the Total Force.⁸⁵

On 23 March 2010, the Army War College published Lieutenant Colonel Joseph Baldwin's "The Army's Operational Reserve Force." In this monograph, he examined some differences between the strategic and operational reserve. One key difference was terminology versus practice. Lieutenant Colonel Baldwin noted, "The current debate is not really about whether to increase operational reliance on the reserve forces of the U.S. Army for national defense. That decision was made in 1973 with the *Total Force* Policy and the end of the Draft."⁸⁶ Based upon Lieutenant Colonel Baldwin's statement there is no difference between the 20th and 21st century Reserve forces. Additionally, within Lieutenant Colonel Baldwin's model, the operational reserve would call upon RC forces for any mission whether pursuant to presidential call-up during wartime or not.

The *2013 Annual Report on Army Business Transformation* identifies the Army's Item Unique Identification (IUID) program as improving "the Army's ability to optimize logistics processes."⁸⁷ Applied to reserve component equipping and property accountability this initiative "integrates data from existing systems to provide transparency of equipment procurements from budget requests to unit-level deliveries."⁸⁸ In simple terms, IUID provides equipment visibility and maintenance data across the Army, and improves the Army's ability to analyze and predict

⁸⁵The Office of the Assistant Secretary of Defense Reserve Affairs, *Rebalancing Forces*.

⁸⁶Joseph R. Baldwin, "The Army's Operational Reserve Force" (monograph, Army War College, Carlisle, PA, 3 March 2010), Defense Technical Information Center. <http://handle.dtic.mil/100.2/ADA522014> (accessed 30 March 2013).

⁸⁷Department of the Army, *2013 Annual Report on Business Transformation*, Office of Business Transformation, 1 March 2013, http://www.army.mil/article/97650/Army_Publishes_2013_Business_Transformation_Report/ (accessed 17 March 2013).

⁸⁸Department of the Army, *2013 Annual Report on Business Transformation*.

expenses. Extending optimization to Army Reserve physical, social, and economic processes can provide predictable solutions to the operational force identified in DoDD 1200.17.

In another monograph, “Untested Waters: Challenges Facing an Operational Army Reserve,” published on 30 March 2007, Lieutenant Colonel Tracy Thompson identified several challenges the RC could face as an operational reserve under AFORGEN. The families and civilian employers faced new challenges presented by this shift in operational tempo. USAR Soldiers, instead of mobilizing once in a lifetime, mobilized every five to six years. Once eager to support Soldiers, business owners had to decide whether they could lose a valuable employee for one or five years while maintaining the same job or equivalent employment for their return.⁸⁹ Legally, employers cannot deny employment based upon military service, but in a recession, employers can easily find workers unencumbered by military service. Most employees, ages 18-44, change jobs every three to eight years in the U.S.⁹⁰ With this new way of thinking, there may be a pool of Soldiers and employers prepared for a change every five years. With the ability to identify unemployed Reservists and connect them with employers or to augment mobilizing organizations, the Army Reserve could further contribute to operations and Soldier employment. In his conclusion, Lieutenant Colonel Thompson noted the similarity of an operational reserve and “just-in-time” supply change management.

Supply management requires detailed information on the location and status of each product, or in relation to the military, location of each Soldier, their capabilities, and job status. In today’s information age, there are technological capabilities for linking detailed data on individual Soldiers, their availability, assignment preferences, and their experiences. Periodic

⁸⁹Tracy Thompson, “Untested Waters: Challenges Facing an Operational Army Reserve” (monograph, Army War College, Carlisle, PA, 30 March 2007), Defense Technical Information Center, <http://www.dtic.mil/dtic/tr/fulltext/u2/a469139.pdf> (accessed 30 March 2013).

⁹⁰Bureau of Labor Statistics, “News Release,” U.S. Department of Labor, 25 July 2012, <http://www.bls.gov/news.release/pdf/nlsoy.pdf> (accessed 30 March 2013).

surveys and a Facebook or Linked-in style website managed by Army Human Resources Command (HRC) could provide a better means to track detailed Soldier data. Collaborating with or linking various, management systems could provide the additional data to optimize force management capabilities. However, there is an underlying problem of how to maintain accurate data. Currently, HRC can identify a Soldier's last mobilization date, but still cannot determine utilization potential if ordered to Active Duty. Although the vast majority of RC Soldiers are responsible and readily respond to orders, some continue to be absent without leave (AWOL), failing to report for mobilization. Additional data and using optimization techniques could identify potential AWOL Soldiers.

While the Army awaits a transformation strategy from Secretary of Defense Chuck Hagel, the Army Reserve has several sources to draw upon for guidance. The 2010 *Quadrennial Defense Review* (QDR) continued the theme of rebalancing the force while describing the “likely” need for an operational reserve “well into the future,” and capable of “preventing and deterring conflict,” one of the QDR’s four priority objectives.⁹¹

Chief of Staff, General Raymond Odierno has his own guidance provided in three focus areas, Prevent, Shape, and Win:

1. The Army must prevent conflict
2. The Army must help shape the international environment
3. The Army must be ready to win decisively and dominantly⁹²

Subsequently, in “Rally Point 32,” Lieutenant General Jeffrey Tally, Chief of the Army Reserve, has provided the “Role of the Army Reserve—Enabling Prevent, Shape, Win” as a guide for the

⁹¹Department of Defense, *Quadrennial Defense Review* (Washington, D.C.: Government Printing Office, 2011), 53.

⁹²Raymond T. Odierno, "Prevent, Shape, Win," Small Wars Journal, 12 December 2011, <http://smallwarsjournal.com/blog/prevent-shape-win> (accessed 30 March 2013).

Army Reserve.⁹³ Within his guidance, General Talley specifically states, “Reduced resourcing is to be expected, and this will require continued effectiveness with gained business efficiencies, something Citizen-Soldiers are well-equipped to do using their civilian-acquired skills and experiences.”⁹⁴

Once centered on rebalancing the forces, the current Army Reserve transformation efforts should adhere to the Chief’s guidance and revolve around the Total Force and ARFORGEN. A Reserve centric strategy and Total Force structure should emerge from adapting readiness and relevance to any military budget. According to the Army’s Office of Business Transformation (OBT), the Army is looking to use national resources more efficiently across the Army enterprise. Toward this end, the OBT assists the Army toward improving the effectiveness and efficiency of business processes, transforming business systems, managing information technology, promoting resource-informed decision-making, and achieving an integrated management system.⁹⁵ Realizing the OBT goals would provide some of the desired innovations, culminating in a Total Force realization, unlike the disparity identified in Lieutenant Colonel Baldwin’s “The Army’s Operational Reserve Force.” The Total Force by 2020 would possess several key capabilities spread across the components that would make each ideally suited to operate in either the strategic, operational or tactical environment. These comments regarding the Total Force are quite similar to Secretary of Defense James R. Schlesinger’s 1973 declaration, “*Total Force* is no

⁹³Jeffrey W. Talley, “Rally Point 32,” Army Reserve, 6 June 2013, <http://www.usar.army.mil/resources/ForSoldiers/Pages/Rally-Point-32.aspx> (accessed 30 March 2013).

⁹⁴Ibid.

⁹⁵Department of the Army, *2013 Annual Report on Business Transformation*.

longer a concept. It is now a *Total Force* Policy which integrates the active, guard, and reserve forces into a homogenous whole.”⁹⁶

With today’s divergent political goals and lobbying by the Association of the United States Army, Reserve Officers Association, and National Guard Association of the United States, the homogenous whole requires continuous adaptation to emerging financial environments. Regarding appropriations, few government leaders think of the Army as a whole and many members of Congress see the AC, ARNG, and USAR as three armies rather than one. Still the RC must maintain a ready and relevant place within the Total Force. One approach toward this goal is to look for intellectual growth and fully integrating Army Reserve operations with the efforts of joint, interagency, and multinational partners.

The Army Reserve’s focus could center on the operational level of war. This position within the Total Force would direct operational training and doctrine to link service and component specific capabilities to geographical combatant commands. Only a clear understanding of the RC can provide a rapid response to any crisis and provide the relevant support and services. To this end, the Army Reserve must integrate changing doctrine and a vision of the RC place within national military strategy.

Defense Budget Priorities

In the January 2012 Defense Budget Priorities and Choices, the Office of the Vice Chairman of the Joint Chiefs of Staff identifies a 22 percent decrease in defense spending while extolling the President’s budget proposal for increased funding after fiscal year 2013. A smaller active force will require a capable and ready Army Reserve and National Guard prepared to optimize the force around financial constraints. Among other applications, a strong RC is a vital

⁹⁶Charles J. Gross, *The Air National Guard and the American Military Tradition: Militiaman, Volunteer, and Professional* (Washington, D.C.: U.S. Government Printing Office, 1995), 115.

element of the concept of reversibility embedded in the strategic guidance. Consequently, the Army is making no strength reductions in the Army Reserve and National Guard. Ideally, the Army will leverage the operational experience and institute a progressive readiness model in the RC in order to sustain increased readiness. In particular, the Army Reserve will maintain key combat support capabilities such as sustainment as well as combat service support capabilities such as civil affairs maintained at a high readiness level in the RC.

Although the budget priorities appear similar to the 1990s, there are significant differences. The post-Cold War reductions came from the base defense budget rather than ending overseas contingency operations. Under the new plan, the base budget will increase to match inflation in fiscal year 2014, while savings come from withdrawing troops from Afghanistan. In contrast, the Cold War drawdown occurred as America's leading military rival, the Soviet Union, was also declining. In addition, the 1990 cuts came after a decade-long defense build-up that emphasized procurement and modernization of technically superior U.S. military equipment. Even with the large budget increases in the base defense budget, during the past decade, the Army still has gaps in modernization.

In preparing the 2012 Defense Budget Priorities, the DoD attempted to avoid the mistakes of previous drawdowns that endeavored to maintain more force structure than the budget could afford. Reserve and Army readiness suffered as a result, which took years of investment to reverse. The new budget approach to readiness recognizes that after a decade of focus on counter-insurgency operations, the U.S. armed forces must hone other capabilities needed for a wider range of missions and adversaries.

Applying this budget guidance, the Army Reserve should engage in expectation management and take heed of Lieutenant Colonel Thompson's warning that reserve forces are not always available for rapid utilization. Additional concerns remain in the *Comprehensive Review*

of the Future Role of the Reserve Component, objectives. From this study, the Office of Assistant Secretary of Defense for Reserve Affairs identified six objectives.

1. Costs. Establishing a common Departmental baseline costing methodology for the *Total Force* and identifying the instances where such common baseline costing is not feasible.
2. Uses. Leveraging Departmental plans for the future to determine how to use the capabilities and capacities of the Guard and Reserve to best advantage during drill time, periods of Active Duty, and during mobilization.
3. Roles. Determining those roles for which the Guard and Reserve are well suited and where Guard and Reserve forces should be considered as a force of first choice.
4. Standards. Determining the conditions and standards that provide for a trained, equipped, ready, and available Guard and Reserve in order to meet the demands of the *Total Force* while maintaining the support of service members, their families, and employers.
5. Rebalancing. Proposing recommendations on rebalancing the mix of Active and Reserve Components to meet demands of the Combatant Commands based on the Guidance for Employment of the Force (GEF) and the cost-benefit analysis of these proposals.
6. Changes. Proposing needed law, policy, and doctrinal changes required to meet the demands and conditions determined in Objectives 2-5 above.⁹⁷

Baseline costing sounds a lot like removing redundant programs where possible.

Presently the AC, USAR, and ARNG develop and fund various administrative systems. One success is the Medical Protection System, colloquially referred by the acronym MEDPROS. By centralizing medical information, the DoD reduces operating costs. In opposition to the MEDPROS success is the Defense Integrated Military Human Resources System or DIMHRS. The DoD cancelled this system in 2010 after a cost of \$850 million dollars and 10 years of research and development. The only successfully integrated pay and administration system within DoD is the Marine Corps Total Force System. The Army Reserve could model the Marine Corps

⁹⁷The Office of the Assistant Secretary of Defense Reserve Affairs, *Comprehensive Review of the Future Role of the Reserve Component*, Reserve Affairs Publications, 5 April 2011, [http://ra.defense.gov/documents/publications/Comprehensive%20Reserve%20Review%20\(5Apr11\)%20Ver26h%20-%20Final.pdf](http://ra.defense.gov/documents/publications/Comprehensive%20Reserve%20Review%20(5Apr11)%20Ver26h%20-%20Final.pdf) (accessed 30 March 2013).

system and apply optimization techniques to identify administrative and pay actions that can contribute to an adaptable baseline. Another objective is leveraging departmental plans to use reserve forces. Effective use of reserve forces requires decision makers understand the nature of the RC and maintain the inter-service relationships built over the past decade. Although this could increase rather than reduce departmental manpower requirements, the alternative is an educational campaign to teach non-reserve military and civilian leaders how to manage part-time forces and the legal constraints associated with utilizing any RC unit. Preferably, the Army would adequately staff the Army Reserve command structures already in place and fully integrate personnel management and authority to manage Army Reserve coded positions across the Total Force. Presently, the Chief of the Army Reserve, USARC Commander, has influence but little authority over Reserve Soldiers dispersed throughout the DoD. For example, Army HRC controls administrative actions and orders for the Individual Ready Reserve and Individual Mobilization Augmentee Soldiers. Improved coordination through systems integration between USARC and HRC would improve force management within the Total Force. Also confusing is the divergence of unit assignments from USARC and U.S. Army Force Management Support Agency (USAFMSA). The manpower and equipment (MTOE & TDA) documents published by USAFMSA periodically assigns units to USAR and AC commands.

When rebalancing the force to meet future national security challenges, the National Guard and Army Reserve should be a “force of first choice” for those tasks for which they are particularly well suited, owing to their overall cost effectiveness, and skill sets that they can provide. Missions that follow a predictable, operational schedule fall into this category. The problem with organizing around the predictable is that forces are often unprepared and inadequate when responding to the unpredictable. Perhaps a better solution is to prepare the force for self-organization and the ability to transition this to rapid changes in manpower, equipment, and force alignment. A simplified example is when a Geographical Combatant Command requests a space

support element. If there are Army Reserve units with the capabilities, the personnel and equipment can easily organize and mobilize under a new or subordinate unit organization. Soldiers with the correct occupational specialty, 40A-Space Operations Officer or 25S-Satellite Communications Systems Operator, are first choice for mobilization, but personnel from any service with similar civilian training or experience could also fill the positions. If there is no organization capable of providing forces, then an integrated data search should identify ideal candidates and focus solicitation first to individuals vice advertising tours. Currently the Army advertises volunteer positions via HRC and Tour of Duty websites, which exclude potential Air Force, Navy, and Marine personnel. To close out this scenario, a new Space Support Element and USAFSMA Joint Manning Document would establish a unit identification code and match the selected individuals. As long as each organization has the capacity to transition and share responsibility without parochial command and control issues the Army, Air Force, Navy, and Marine forces will execute their mission.

Optimizing Responsibilities

The ultimate goal is to find an optimal balance between needs, abilities, and employment of Army Reserve forces without a financial or political struggle. Under the operational force, the Army no longer manages the RC as “serving when needed.”⁹⁸ Instead, elements of all three Army components, AC, USAR, and ARNG continuously assume varying degrees of strategic, operational, and tactical mission responsibilities. Figure 1 depicts how the three components could align toward interrelated levels of war.

⁹⁸U.S. Army Recruiting Command, "About the Army," U.S. Army Recruiting Command, <http://www.goarmy.com/about/service-options/active-duty-and-reserve-duty.html> (accessed 19 March 2013).

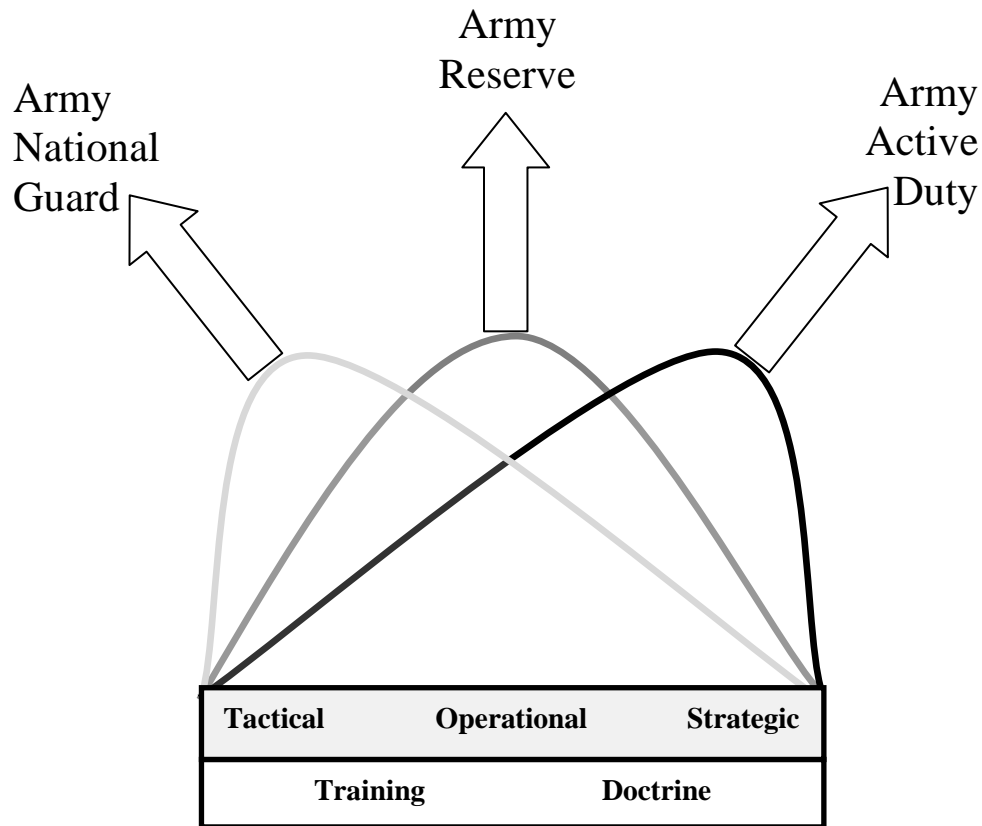


Figure 3. Alignment of Responsibilities

Source: Created by author.

By ascribing a focus and preponderance of forces toward the three levels in figure 3, the Army could maintain a full range of operations in each component, while designating primary responsibilities toward inherent strengths found in the AC, USAR, and ARNG. The result is a clearer understanding and simple framework, with the AC oriented toward strategic guidance and preparation, the Army Reserve focused upon operational requirements and education, and the National Guard trained and ready to execute any mission. This alignment plays to the strengths associated with each organization. Weighted heavily with senior leaders the AC has the strategic connections to the President and Congress. The Army Reserve, with its support capabilities and multiple connections to federal and local institutions, bridges strategic and tactical

responsibilities. The National Guard, with Title 10 and Title 32 capabilities, can execute and lead tactical operations in support of federal and state requirements.

The Army Reserve is also in a unique position to coordinate between the Army, other government agencies, and civilian institutions. There are various non-military resources in the government and civilian sectors. With Reservists positioned in both sectors, the Army Reserve can direct collaboration with outside resources to support and enhance operational level responsibilities. Prior to execution, the Army Reserve must prepare the current Army and political structures and leaders for the changes. America needs a strong military, but strength comes in many forms.

Operational Reserve and Total Force

Army Transformation has changed in the period since Secretary Gates's retirement, but its key principles have remained constant. In relation to the operational reserve mantra, the current Total Force concept directs more integration, recognizing that military change is an ongoing process, rather than a path to a clearly definable, final objective. Nevertheless, the key concepts forming the basis of the process remain the same.

On 5 April 2011, the Office of the Vice Chairman of the Joint Chiefs of Staff and the Office of Assistant Secretary of Defense for Reserve Affairs published a *Comprehensive Review of the Future Role of the Reserve Component*, discussing the future role and importance of the RC.⁹⁹ According to the comprehensive review, the RC must perform the following six roles:

1. Contribute to America's resolution of overseas conflicts
2. Ensure defense of the homeland against external attack and support civil authorities in response to attacks or to natural disasters

⁹⁹The Office of the Assistant Secretary of Defense Reserve Affairs, *Comprehensive Review of the Future Role of the Reserve Component*.

3. Augment and reinforce the National effort with combat and support forces in case of major combat operations
4. Efficiently support Combatant Commanders around the world
5. Provide vital National Defense capabilities
6. Support efforts to preserve the all-volunteer force¹⁰⁰

Of these six, the first half support contingency operations, but Army doctrine, ADP 1 now states the Army Reserve “is not organized for contingency response.”¹⁰¹ Such disconnected points between DoD publications are representative of the political separations that still arise within the Army, and the problems associated with large bureaucracies.

General Raymond Odierno, the Army Chief of Staff, described his vision of the Army's future in a press conference at the Association of the United States Army Conference on 22 October 2012.¹⁰² Rather than describing any changes to Army Transformation, General Odierno pointed out the need to maintain the Army's hard-earned combat experience in the ranks, while adapting to the new strategic environment. He emphasized the need to “optimize the Army for the Joint Force” and mentioned a need to remain engaged around the world. Specific questions asked whether the Army Reserve and National Guard would experience reduced funding. General Odierno's response from a budget perspective identified that the Army has made no decisions, but any reduction would be to the Total Force's “generating and operating force” of which the Guard and Reserve are a part.¹⁰³ If the Army reduces its budget, then all components will accept

¹⁰⁰The Office of the Assistant Secretary of Defense Reserve Affairs, *Comprehensive Review of the Future Role of the Reserve Component*.

¹⁰¹Department of the Army, ADP 1, A-2.

¹⁰²AUSA, “AUSA Press Conference,” DIVIDS, 22 October 2012, <http://www.dvidshub.net/webcast/2626> (accessed 23 October 2012).

¹⁰³AUSA.

cuts based upon a holistic approach. Currently the AC accepts the majority of these reductions, but balance between readiness, modernization, and end structure will determine the future depth of personnel and financial cuts to the Army Reserve.

How the Army Reserve prepares for, and responds to personnel reductions will set the stage for many years to come. A focus on reduced manpower may result in a hollow force unable to meet future requirements for trained military leaders. A focus on reduced or unfunded equipment requirements will result in a force unable to meet or sustain capabilities. A focus on shifting priorities will skew military understanding among units and result in a limited force unable to execute mission related or war fighting functions at the tactical, operational, and strategic levels of war. In preparing the Army Reserve of 2020, leaders and policy makers need a simple and easy to understand structure built upon sound theory and basic principles designed to organize complementary capabilities across all Army components, yet fluid enough to fill any non-contingency or contingency requirements.

CONCLUSION

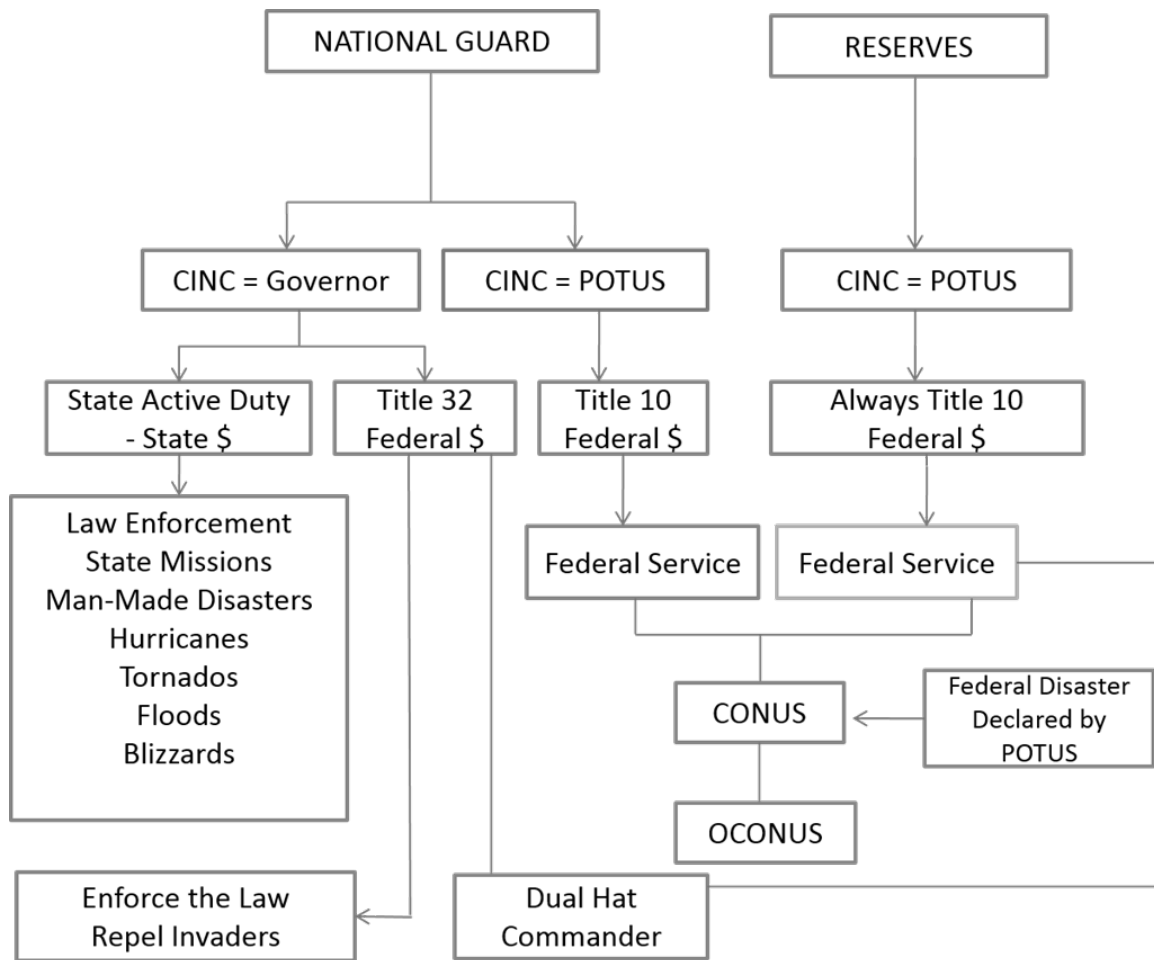
Political and economic conditions have always contributed to the Army Reserve force structure and requirements whether in war or peace. The history outlined in this paper provides an illustration of the simplicity and complexity applied toward the Army. The original U.S. Constitution contains 4,543 words including signatures. *The Comprehensive Review of the Future Role of the Reserve Component* contains over 199,000 words including annexes. The contrast between the above documents and other referenced sources indicate the need for better integration or a smaller bureaucracy to provide honest and clear guidance to the Army Reserve.

Politically, the Army Reserve has always wielded influence closely tied to their communities and local populace. Because of these ties, the Army Reserve will remain as a standing organization within the U.S. Army. However, from historical examples, funding appropriations and personnel authorizations change frequently.

The Army Reserve can develop an approach to change based upon Optimization Theory and Optimal Control Techniques to construct an adaptive model for resynchronizing with the U.S. economy and moving forward as an operational force. Transformation through optimizing structures and processes holds the potential to dynamically rebalance force structures, cultivate cost management, and build collaboration within changing fiscal boundaries. Reinvigorating the TASS with a thorough understanding of the organization and interconnected systems can establish conditions for building a dynamic education system capable of adapting to congressional appropriations. As a result, the Army Reserve units can remain relevant, and serve as the proponent for coordinating education and doctrine at the operational level for all service components. Skills developed during a decade of war will sustain the Army Reserve's readiness for a few years, but forecasting for the Army and Joint Force of 2020 requires an adaptable force structure. RA and RC leaders require knowledge and resources for annually rebalancing personnel, equipment, training, and execution to meet broad mission requirements in financially constrained environments. The Army Reserve has an opportunity to innovate that only comes with budget constraint.

When placed in concert with one another, historically informed leaders, optimal control, and Army Reserve transformation will establish common threads of excellence in the Total Force. Success for the Total Force of 2020 begins with a clear vision and thoughtful unit application at either the strategic, operational, or the tactical level of war.

APPENDIX A: DIFFERENCE BETWEEN NATIONAL GUARD AND RESERVES



Source: Office of the Assistant Secretary of Defense Reserve Affairs, *Command Briefing: America's National Guard and Reserve Force; An Indispensable, Valuable, and Operational Force for the 21st Century*, Department of Defense, 3 January 2013, <http://ra.defense.gov/documents/publications/OSDRACommandBrief.pptx> (accessed 30 March 2013), 47.

APPENDIX B: TOTAL DOD RESERVE COMPONENTS

Total DoD Reserve Mobilization Potential *					3,190,372
					Enl: 2462232 Off: 728140
Ready Reserve			1,082,628	Standby Reserve	Retired * (Qtr Rpt, Incl AC and RC)
			Enl: 928125 Off: 154503		
Selected Reserve		835,435	IRR/ING		
		Enl: 709314 Off: 126121			
PAID DRILL STRENGTH	Active Guard Reserve (AGR)	Individual Mobilization Augmentee (IMA)			
744,921	76,913	13,601	247,193	14,819	2,092,925
Enl: 644096 Off: 100825	Enl: 60248 Off: 16665	Enl: 4970 Off: 8631	Enl: 218811 Off: 28382	Enl: 6339 Off: 8480	Enl: 1527768 Off: 565157

Source: Office of the Assistant Secretary of Defense Reserve Affairs, *Command Briefing: America's National Guard and Reserve Force; An Indispensable, Valuable, and Operational Force for the 21st Century* Department of Defense, 3 January 2013, <http://ra.defense.gov/documents/publications/OSDRACCommandBrief.pptx> (accessed 30 March 2013), 18.

APPENDIX C: NATIONAL DEFENSE OUTLAYS (1940-2013)

**NATIONAL DEFENSE OUTLAYS FOR MAJOR PUBLIC DIRECT PHYSICAL
CAPITAL INVESTMENT: 1998–2013**

(in millions of dollars)

Fiscal Year	Total	Department of Defense—Military				Atomic Energy and Other Defense		
		Total	Procurement	Military Construction	Family Housing	Total	Construction and Rehabilitation of Physical Assets	Major Equipment
1998	53,545	52,545	48,229	3,433	883	1,000	688	312
1999	53,880	52,893	48,861	3,301	731	987	771	216
2000	56,056	55,429	51,294	3,442	693	627	511	116
2001	61,039	60,358	56,145	3,522	691	681	575	106
2002	68,342	67,532	62,587	4,058	887	810	707	103
2003	74,707	73,784	67,891	5,112	781	923	795	128
2004	83,610	82,560	76,193	5,516	851	1,050	754	296
2005	89,474	88,423	82,261	5,368	794	1,051	663	388
2006	97,268	96,170	89,711	5,588	871	1,098	654	444
2007	107,826	106,915	99,629	6,145	1,141	911	630	281
2008	126,311	125,603	117,346	6,974	1,283	708	381	327
2009	139,713	139,209	129,202	9,109	898	504	222	282
2010	147,215	146,465	133,583	11,790	1,092	750	130	620
2011	141,560	141,021	127,987	11,845	1,189	539	69	470
2012 estimate	155,785	155,188	139,923	14,814	451	597	87	510
2013 estimate	142,979	142,370	124,560	17,231	579	609	63	546

Source: The Whitehouse Office of Management and Budget, *Historical Tables: Table 9.4- National Defense Outlays for Major Public Direct Physical Capital Investment: 1940-2014* (Washington, D.C.: The Whitehouse, 2001), <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2014/assets/hist09z4.xls> (accessed 30 March 2013).

BIBLIOGRAPHY

- Assistant Secretary of the Army for Financial Management and Comptroller. Budget Materials FY 2014." Army Financial Management, Department of the Army, 17 February 2012. <http://www.asafm.army.mil/offices/BU/BudgetMat.aspx> (accessed 30 March 2010).
- _____. "Budget Materials for FY 2001: Army Reserve (OMAR)." Army Financial Management, Department of the Army. <http://www.asafm.army.mil/offices/BU/BudgetMat.aspx> (accessed 30 March 2013).
- _____. "Budget Materials for FY 2013: Army Reserve (OMAR)." Army Financial Management, Department of the Army. <http://www.asafm.army.mil/offices/BU/BudgetMat.aspx> (accessed 30 March 2013).
- AUSA. "AUSA Press Conference." DIVIDS, 22 October 2012. <http://www.dvidshub.net/webcast/2626> (accessed 23 October 2012).
- Baldwin, Joseph R. "The Army's Operational Reserve Force." Monograph, Army War College, Carlisle, PA, 3 March 2010. Defense Technical Information Center. <http://handle.dtic.mil/100.2/ADA522014> (accessed 30 March 2013).
- Bedrossian, Nazareth, Mark Karpenko, and Sagar Bhatt. "Overclock My Satellite." *IEEE Spectrum* 49, no. 11 (November 2012): 54-62.
- Bureau of Labor Statistics. "News Release." U.S. Department of Labor, 25 July 2012. <http://www.bls.gov/news.release/pdf/nlsoy.pdf> (accessed 30 March 2013).
- Bush, George W. *Address Before a Joint Session of the Congress on the United States Response to the Terrorist Attacks of September 11*. The American Presidency Project, 20 September 2011. <http://www.presidency.ucsb.edu/ws/index.php?pid=64731&st=&st1=#> (accessed 30 March 2013).
- Carafano, James J. "Total Force Policy and the Abrams Doctrine: Unfulfilled Promise, Uncertain Future." Foreign Policy Research Institute, 3 February 2005. <http://www.fpri.org/enotes/20050203.military.carofano.totalforcepolicyabramsdoctrine.html> (accessed 8 February 2013).
- Carafano, James J., Alane Kochems, and David D. Gentilli. "The Hollow Force." The Heritage Foundation, 27 January 2006. <http://www.heritage.org/research/reports/2006/01/the-hollow-force-background-and-issues> (accessed 31 March 2013).
- Carlton, John T, John F Slinkman, and Alexander Jackson. *The ROA Story*. Washington, D.C.: Reserve Officer Association, 1982.
- Cassidy, Robert M. "Prophets or Praetorians? The Upton Paradox and the Powell Corollary." *Parameters* 33, no. 3 (Autum 2003): 130-143.

- Center of Military History. *American Military History Volume II*. Edited by Richard W. Stewart. Washington, D.C.: Center of Military History, 2010.
- Collins, Elizabeth M. "Secretary of the Army talks about the Army of today, the Army of 2020." *Soldiers* (22 June 2012). <http://soldiers.dodlive.mil/2012/06/secretary-of-the-army-talks-about-the-army-of-today-the-army-of-2020/> (accessed 30 March 2013).
- Crossland, Richard B., and James T. Currie. *Twice the Citizen*. Amsterdam, Holland: Fredonia Books, 1983.
- CSAF Strategic Studies Group. "What is a Hollow Force?" U.S. Air Force, 18 May 2011. www.af.mil/shared/media/document/AFD-120213-053.pdf (accessed 24 March 2013).
- Cunningham, Henry. "Lt. General Jeffrey Talley Takes Command of Army Reserve Command." *Fayetteville Observer*, 10 June 2012. <http://www.fayobserver.com/articles/2012/06/10/1183408> (accessed 17 March 2013).
- Department of the Army. *2013 Annual Report on Business Transformation*. Office of Business Transformation, 1 March 2013. http://www.army.mil/article/97650/Army_Publishes_2013_Business_Transformation_Report/ (accessed 17 March 2013).
- _____. Army Doctrine Publication 1, *The Army*. Washington, D.C.: Department of the Army, 7 November 2012.
- _____. Army Regulation 5-1, *Total Army Quality Management*. Washington, D.C.: Department of the Army, 15 March 2002.
- _____. *Department of the Army Historical Summary: Fiscal Year 1975*. U.S. Army Center of Military History, 1997. <http://www.history.army.mil/html/bookshelves/collect/dahsum.html> (accessed 23 February 2013).
- _____. *Department of the Army Historical Summary: Fiscal Year 1989*. U.S. Army Center of Military History. <http://www.history.army.mil/html/bookshelves/collect/dahsum.html> (accessed 23 February 2013).
- _____. *Department of the Army Historical Summary: FY 1990-1991*. U.S. Army Center of Military History, 1997. <http://www.history.army.mil/books/dahsum/1990-91/ch08.htm> (accessed 20 January 2013).
- _____. *Department of the Army Historical Summary: FY 1992*. U.S. Army Center of Military History, 2001. <http://www.history.army.mil/html/bookshelves/collect/dahsum.html> (accessed 23 February 2013).
- _____. *Department of the Army Historical Summary: FY 1993*. U.S. Army Center of Military History, 1993. <http://www.history.army.mil/html/bookshelves/collect/dahsum.html> (accessed 23 February 2013).
- _____. *Department of the Army Historical Summary: FY 1994*. U.S. Army Center of Military History, 2000. <http://www.history.army.mil/html/bookshelves/collect/dahsum.html> (accessed 23 February 2013).

- _____. *Department of the Army Historical Summary: FY 1999*. U.S. Army Center of Military History, 2006. [http://www.history.army.mil/html.bookshelves/collect/dahsum.html](http://www.history.army.mil/html/bookshelves/collect/dahsum.html) (accessed 23 February 2013).
- _____. Field Manual 1, *The Army*. Washington, D.C.: Department of the Army, 14 June 2005.
- Department of Defense. "About the Department of Defense." U.S. Department of Defense. <http://www.defense.gov/about/> (accessed 17 March 2013).
- _____. *DoD Dictionary of Military and Associated Terms*. Defense Technical Information Center, 15 March 2013. http://www.dtic.mil/doctrine/dod_dictionary/?zoom_query=cross-leveling (accessed 30 March 2013).
- _____. *Quadrennial Defense Review*. Washington D.C.: Government Printing Office, 2010.
- Deputy Chief of Staff Army G1. "Lean Six Sigma, Green Belt." Army G1, 2 January 2012. <http://www.armyg1.army.mil/leansixsigma/greenbelt.asp> (accessed 30 March 2013).
- Dick, Charles. *The "Dick" Bill and Comments: H.R. 11,654, "A Bill to Promote the Efficiency of the Militia and for Other Purposes," to Supersede the Archaic Militia Laws Enacted in 1792*. Vol. 4. Brooklyn, NY: Execute Committee of the Interstate National Guard Association, 1902. <http://lccn.loc.gov/96190993> (accessed 19 March 2013).
- Duchesneau, John T. "The History of Fort Adams, The Rock on Which the Storm Will Beat." Our Olden Cities of the Web. <http://www.oocities.org/jmgould39/adhistpt4.html> (accessed 7 February 2013).
- Duhigg, Charles. "Depression, You Say? Check Those Safety Nets." *New York Times*, 23 March 2008. http://www.nytimes.com/2008/03/23/weekinreview/23duhigg.html?pagewanted=all&_r=0 (accessed 30 March 2013).
- Gates, Robert, U.S. Secretary of Defense, Department of Defense Directive 1200.17, *Managing the Reserve Components as an Operational Force*. Washington, D.C.: Department of Defense, 29 October 2008.
- Graham, Bradley. "General Says Army Reserve is Becoming a 'Broken' Force." *The Washington Post*, 6 January 2005.
- Gross, Charles J. *The Air National Guard and the American Military Tradition: Militiaman, Volunteer, and Professional*. Washington, D.C.: U.S. Government Printing Office, 1995.
- _____. "The Air National Guard: Past, Present, and Future Prospects." *Airpower Journal* 10, no. 4 (Winter 1996): 59-69.
- Hamersly, Lewis R. *Biographical Sketches of Distinguished Officers in the Army and Navy*. New York, NY: L. R. Hamersly, 1905.
- Helms, Harry. "About the 94th." 94th Division Historical Society, 4 January 2013. <http://94thindiv.com/about.htm> (accessed 21 January 2013).

- Kennedy, John F. "Radio and Television Report to the American People on the Berlin Crisis, July 25 1961." *Public Papers of the Presidents of the United States: John F Kennedy: Containing the Public Messages, Speeches, and Statements of the President, January 20 to December 31, 1961*. Washington, D.C.: U.S. Government Printing Office, 1962.
- Kenniston, Steve. "Efficiency vs. Optimization." *The Storage Alchemist*, 30 June 2011. <http://www.thestoragealchemist.com/efficiency-vs-optimization> (accessed 30 March 2013).
- Kirk, Donald E. *Optimal Control Theory*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 2004.
- Krippendorff, Klaus. "Optimization Theory." Klaus Krippendorff's Dictionary of Cybernetics. <http://cleamc11.vub.ac.be/ASC/Kripp.html> (accessed 9 August 2012).
- Laird, Melvin K. "We Don't Need a Military Draft." *Washington Post*, 21 February 2013.
- Martin, Binkin, and William W. Kaufmann. *U.S. Army Guard and Reserve: Rhetoric, Realities, Risk*. Washington, D.C.: The Bookings Institution, 1989.
- Meadows, Robert A., Linda P. Beckerman, and Chet Richards. "Systems Engineering: The Key to TQM." *Program Manager* 19 (1990): 2-6.
- Nagl, John, and Travis Sharp. *An Indispensable Force: Investing in America's National Guard*. Washington, D.C.: Center for a New American Security, 2010.
- Odierno, Raymond T. Quoted in J. D. Leipold. "CSA Warns of Budgetary Perfect Storm." *Army News Service*, 25 January 2013. http://www.army.mil/article/95015/CSA_warns_of_budgetary__perfect_storm/ (accessed 30 March 2013).
- _____. "Prevent, Shape, Win." *Small Wars Journal*, 12 December 2011. <http://smallwarsjournal.com/blog/prevent-shape-win> (accessed 30 March 2013).
- Odom, William E. *The Collapse of the Soviet Military*. New Haven, CT: Yale University Press, 1998.
- Office of Army Reserve History. *Army Reserve A Concise History*. U.S. Army Reserve Command, 11 November 2012. http://www.usar.army.mil/ourstory/History/Documents/Concise%20History%20Brochure_FA_Web.pdf (accessed 13 November 2012).
- _____. "History - Home (US Army Reserve)." U.S. Army Reserve Command, 1 November 2012, http://www.usar.army.mil/ourstory/History/Documents/Army_Twice%20the%20Citizen_Web.pdf (accessed 9 February 2013).
- Office of the Undersecretary of Defense (Comptroller). DoD Budget Request, "Operations and Maintenance Overview." Department of Defense, 2008. <http://comptroller.defense.gov/budget2008.html> (accessed 30 March 2013).
- _____. DoD Budget Request, "Operations and Maintenance Overview." Department of Defense, 2009. <http://comptroller.defense.gov/budget2009.html> (accessed 30 March 2013).

- Office of the Assistant Secretary of Defense Reserve Affairs. *Command Briefing: America's National Guard and Reserve Force; An Indispensable, Valuable, and Operational Force for the 21st Century*. Department of Defense, 3 January 2013. <http://ra.defense.gov/documents/publications/OSDRACommandBrief.pptx> (accessed 30 March 2013).
- _____. *Comprehensive Review of the Future Role of the Reserve Component*. Reserve Affairs Publications, 5 April 2011. [http://ra.defense.gov/documents/publications/Comprehensive%20Reserve%20Review%20\(5Apr11\)%20Ver26h%20-%20Final.pdf](http://ra.defense.gov/documents/publications/Comprehensive%20Reserve%20Review%20(5Apr11)%20Ver26h%20-%20Final.pdf) (accessed 30 March 2013).
- _____. *Rebalancing Forces*. Reserve Affairs Publications, 15 January 2004. <http://ra.defense.gov/documents/publications/rebalancingforcesfinalfinald1.pdf> (accessed 30 March 2013).
- The Official Homepage of the U.S. Army. "Army Total Force Policy." *Stand-To!* 26 July 2010. http://www.army.mil/article/42866/Army_Total_Force_Policy/ (accessed 25 March 2013).
- _____. "Army Campaign Plan 2011." *Stand-To!* 8 February 2011. <http://www.army.mil/standto/archive/2011/02/08/> (accessed 25 March 2013).
- Orrell, John. "Reserve & Guard leaders to House Subcommittee: We should remain Operational Reserve." The Office of the Assistant Secretary of Defense Reserve Affairs, 30 March 2011. <http://ra.defense.gov/news/main/operationalReserve.html> (accessed 30 March 2013).
- Pennsylvania Commission. *Fiftieth Anniversary of the Battle of Gettysburg*. Edited by Lewis E. Beitler. Harrisburg, PA: Pennsylvania State Printer, 1914.
- Philpott, Tom. "Adapting the Army." *Military Officer* 7, no. 12 (December 2009): 53-57.
- Reserve Forces Policy Board. "Mission and History." The Office of the Assistant Secretary of Defense Reserve Affairs. <http://ra.defense.gov/rfpb/mission/> (accessed 19 March 2013).
- Reserve Officers Association. Resolution No. 11-06, *Management of Operational and Strategic Forces of the Reserve Components*. ROA, 2 February 2011. http://www.roa.org/site/PageServer?pagename=1106_Resolution_MgmtofOper_StrategicRC&AddInterest=1621 (accessed 28 March 2013).
- Root, Elihu. *Report of the Secretary of War*. Washington, D.C.: War Department, 1899.
- Roulo, Claudette. "Dempsey: Transition in Military Uncomfortable, But Necessary." Joint Chiefs of Staff, 17 August 2012. <http://www.jcs.mil/newsarticle.aspx?id=979> (accessed 28 August 2012).
- Schank, John F. et al. *Consolidating Active and Reserve Component Training Infrastructure*. Washington, D.C.: RAND Corporation, 1999.
- Secretary of War. *War Department Annual Reports, 1908*. Washington, D.C.: Government Printing Office, 1980.

- _____. *War Department Annual Reports, 1909*. Washington, D.C.: Government Printing Office, 1909.
- _____. *War Department Annual Reports, 1910*. Washington, D.C.: Government Printing Office.
- _____. *War Department Annual Reports; 1911*. Washington, D.C.: Government Printing Office, 1911.
- _____. *War Department Annual Reports, 1912*. Washington, D.C.: Government Printing Office, 1912.
- _____. *War Department Annual Reports 1931-1940*. In Richard B. Crossland and James T. Currie. *Twice the Citizen: A History of the United States Army Reserve, 1980-1913*. Amsterdam, Holland: Fredonia Books, 2002.
- Smith, Jean E. *Grant*. New York, NY: Simon & Schuster, 2001.
- Stanford University. "Memorial Resolution: George Bernard Dantzig." *Stanford Report*, 7 June 2006. <http://news.stanford.edu/news/2006/june7/memldant-060706> (accessed 28 March 2013).
- Talley, Jeffrey W. "Rally Point 32." Army Reserve, 6 June 2012. <http://www.usar.army.mil/resources/ForSoldiers/Pages/Rally-Point-32.aspx> (accessed 30 March 2013).
- Thompson, Tracy. "Untested Waters: Challenges Facing an Operational Army Reserve." Monograph, Army War College, Carlisle, PA, 30 March 2007, Defense Technical Information Center. <http://www.dtic.mil/dtic/tr/fulltext/u2/a469139.pdf> (accessed 30 March 2013).
- U.S. Army Recruiting Command. "About the Army." U.S. Army Recruiting Command. <http://www.goarmy.com/about/service-options/active-duty-and-reserve-duty.html> (accessed 19 March 2013).
- University of Virginia-Miller Center. "William Howard Taft." Miller Center. <http://millercenter.org/president/taft/essays/biography/2> (accessed 19 March 2013).
- Upton, Emory. *The Military Policy of the United States*. Washington, D.C.: Government Printing Office, 1912.
- Vernon, J. R. "The 1920-21 Deflation: The Role of Aggregate Supply." *Economic Inquiry* 29, no. 3 (July 1991): 572-580.
- Volokh, Eugene. "History Doesn't Repeat Itself, But It Rhymes." The Volokh Conspiracy, 15 February 2005. http://www.volokh.com/archives/archive_2005_02_13-2005_02_19.shtml (accessed 31 March 2013).
- Weigley, Russell F. *History of the United States Army*. New York, NY: Macmillan, 1967.
- The Whitehouse Office of Management and Budget. *Historical Tables: Table 9.4-National Defense Outlays for Major Public Direct Physical Capital Investment: 1940-2014*.

Washington, D.C.: The Whitehouse, 2001). <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2014/assets/hist09z4.xls> (accessed 30 March 2013).

Whitehouse, Michael A. "Paul Warburg's Crusade to Establish a Central Bank in the United States." *The Region* (1 May 1989). The Federal Reserve Bank of Minneapolis. http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=3815 (accessed 30 March 2013).

Winkler, John D. "Developing an Operational Reserve." *Joint Forces Quarterly* 59, no. 1 (4th Quarter 2010): 14-20.